

# A M A T E U R R A D I O

DECEMBER 1963



Vol. 31, No. 12

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## OUR COVER

The Trophy presented to the winner  
of the Ross Hull Memorial V.h.f.  
Contest.

## FEDERAL COMMENT

★

Around 1946, Dr. Werner von Braun, the now famed American rocket  
specialist who originally designed the V2 bomb, wrote his "Mars Project"  
—hardly a book, as it was a step by step design of the necessary facilities  
required to send a space vehicle to Mars—in which it was postulated that  
frequencies in the vicinity of 140 Mc. would be the most suitable for  
space-to-space communications and probably earth-space control. At this  
time, it had not been possible to test this theory, but subsequent launch-  
ings of probes and satellites have given scientists and the electronics  
the opportunity to put this early theory to the test.

It is evidence itself that the Doctor's pronouncement was correct,  
when at Geneva in 1959, a new Earth-Space service came into being and  
was allocated a number of small portions of the spectrum for this work,  
the lowest assignment being 136-137 Mc. Since 1959, the number of  
launchings have gradually increased to the stage where a sufficient number  
of frequencies were not available to cater for the necessary control of  
these space vehicles. The result has been the need for an Extraordinary  
Radio Conference on this subject alone and at the time of writing such  
a meeting is still under way at Geneva.

It was not by chance that the W.I.A. happened to have a representa-  
tive in Geneva for this Conference—from which he will have returned  
by the time this is read—but the result of his having been a member of  
a Government committee which arranged the brief for the official dele-  
gation to Geneva and of also being appointed as an official observer with  
the delegation. For the reasons given above, there has been continuous  
indirect pressure on the services allocated frequencies in the 140 Mc.  
region to make room for expansion of the Space requirements. This  
information, for a variety of reasons, has not been widely known, but  
the Executive have had the matter, through our representative, constantly  
under surveillance. This, to a large extent, has been the reason why  
the delegation's brief was to maintain the status quo for the Amateur  
frequencies in this part of the spectrum.

Although there is still a large amount of work and other determinations  
to be made, we are happy to report through our representative in Geneva,  
that despite quite a struggle, the status quo for the Amateur in Australia  
and throughout the world, has maintained the 1959 Geneva allocations.  
The exception is that a footnote allows Amateurs to make use of OSCAR  
type satellites for communication purposes between 144-146 Mc. This has  
been again a great triumph for the Amateur everywhere and particularly  
in Australia, and does not in these few brief words indicate the amount  
of effort that has been poured into deliberations to achieve this happy  
state of affairs.

With the festive season so close upon us, no nicer Christmas present  
could have been given the Amateur Service than this knowledge that yet  
one more battle for frequencies has been won. It is with the greatest  
satisfaction that Federal Executive wishes all members and non-members  
alike a very happy Christmas!

FEDERAL EXECUTIVE, W.I.A.

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AC125	General purpose audio pre-amplifier and driver of the p-n-p alloy junction type	32	32	10	100	5	90*	500**	TO-1
AC126	High-gain audio pre-amplifier and driver of the p-n-p alloy junction type	32	32	10	100	5	90*	500**	TO-1
AC127	n-p-n/p-n-p germanium alloy junction transistors for use in complementary Class 'B' output stages	+32	+32	+10	+200	+10	90*	280**	TO-1
AC132		32	32	10	200	10	90*	500**	TO-1
AC128 2-AC128	High-gain germanium alloy junction transistor of the p-n-p type designed for use in Class 'B' output stages	32	32	10	1A	20	90*	550**	TO-1
AD140 2-AD140	Germanium junction power transistor of the p-n-p alloy type intended for use as an amplifier in the output stages of receivers and amplifiers operating from either battery or AC mains.	55	55	10	3-0A	500	100*	35W**	TO-3
AF114N	Germanium transistor of the p-n-p alloy diffused type designed for use up to 100Mc/s	32	32	—	10	1	75	50***	TO-44
AF115N	Germanium transistor of the p-n-p alloy diffused type designed for use up to 100Mc/s as mixer-oscillator and for use as RF amplifier up to 27Mc/s	32	32	—	10	1	75	50***	TO-44
AF116N	Germanium transistor of the p-n-p alloy diffused type designed for use as mixer-oscillator and RF amplifier up to 16Mc/s	32	32	—	10	1	75	50***	TO-44
AF117N	Germanium transistor of the p-n-p alloy diffused type designed for use as mixer-oscillator and RF amplifier up to 6Mc/s	32	32	—	10	1	75	50***	TO-44
OC74N 2-OC74N	High-gain germanium alloy junction transistor of the p-n-p type designed for use in Class 'B' output stages	20	20	6	300	—	90*	550**	TO-1

\*\*\* T<sub>amb</sub> = 45°C

\*\* with suitable heat sink

\* 200 hours operation

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M 127

# Checking Signal Quality with the Receiver\*

GEORGE GRAMMER, W1DF

**A** MATTEUR c.w. and phone transmitters generate signals that are intended to be listened to at the receiving end. The quality of the signal is judged by what the receiving operator hears. (Discounting the S meter reading, of course!) This being the case, there is no better "ultimate" instrument than a good receiver for checking a transmitter. Practically every Amateur, therefore, has the means right at hand for finding out whether his transmissions will stand close inspection.

Lack of fancy test equipment is no excuse for putting out a poor signal. Oscilloscopes and meter-type indicators are invaluable while making adjustments and in routine monitoring, if what they present visually is properly interpreted. But the answers they give are, at best, indirect and somewhat inconclusive; they cannot show the actual frequency band occupied by a signal, for example.

What to listen for, in using a receiver for transmitter checking, has been covered in an earlier article.<sup>1</sup> How to go about doing it when the transmitter and receiver are in close proximity is another matter. The receiver, like any other device used for measurement, is quite capable of giving false results when not handled properly.

The problem can be stated in simple terms: The transmitter's signal must be reduced in strength to a level well within the receiver's normal signal-handling capability. But transmitter testing has meaning only when the transmitter can deliver its full output, while F.C.C. regulations forbid the extensive one-way transmissions you have to make in finding out what, if anything, is wrong. So testing on the regular antenna is "out". The use of a dummy antenna is mandatory.

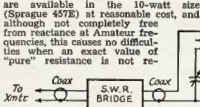
## DUMMY ANTENNAE

At one time a good dummy antenna that would handle some power was mostly something to dream about. However, in recent years several solutions have been offered. There are low-cost commercial dummies available, including kits, for practically any legal Amateur power level. There are also rod-shaped ceramic resistors (Globar type CX) in values equaling transmission line impedances, essentially non-reactive and capable of dissipating up to 100 watts.<sup>2</sup> Methods for using ordinary resistors also have been devised, at least for powers up to 100 watts or so.<sup>3</sup> Any Ham who can afford a transmitter can afford a dummy antenna to go with it—and he should have one.

● No oscilloscope, audio generator, v.t.v.m., or whatnot? No handicap, either, and no excuse for having a poor signal. You can find out what you need to know about your transmitter's output without any of these things, useful as they are.

It is a mistake to assume that to be useful for transmitter testing a dummy antenna has to have some specified ideal characteristics, such as a pure resistance of 52 ohms over a wide frequency range. Such a dummy is convenient to use and will let you measure your actual power output, with the help of an r.f. ammeter. But this isn't all necessary. The principal thing is that the dummy should be capable of dissipating whatever power the transmitter puts out, and should be reasonably stable in operation. That is, its resistance should not change to any significant extent with heating. It is for this reason that incandescent lamps are not suitable; the lamp resistance depends too much on the current in the filament. This is not a serious handicap in rough adjustment of a transmitter, but it is a distinct disadvantage when modulation, especially s.s.b., is being checked, and can lead to erroneous observations.

Non-inductive wire-wound resistors are available in the 10-watt size (Sprague 457E) at reasonable cost, and although not completely free from reactance at Amateur frequencies, this causes no difficulties when an exact value of "pure" resistance is not re-



quired. They can be wired in various combinations of parallel and series to come out in the neighborhood of 50 to 75 ohms, and need no special treatment—other than keeping connecting leads short—if your transmitter's final stage has adjustable loading. If it doesn't, any practicable combination of such resistors can be made to look like a pure resistance of the desired value by the method shown in Fig. 1. The s.w.r. indicator shows when the resistance is transformed to the right value to match a transmission line.

The common parallel-tuned matching circuit is shown in Fig. 1, but if you already have a transmatch using a different circuit it can be used just as readily. Whatever the circuit, the adjustments are made in the same way as when an actual transmission line or antenna is used in place of the dummy antenna, R1.

Putting a dummy antenna together in this way makes economic sense only when it can be done at a considerable

saving as compared with buying a complete unit. It is probably not very attractive for continuous power levels above 50 to 100 watts. But bear in mind that a resistor combination capable of dissipating, say, 50 watts continuously will take at least 100 watts with c.w. keying and probably as much as 200 watts p.e.p. on s.s.b., because of the intermittent nature of the transmitter's output.

The tuned dummy antenna arrangement can be used successfully even if no s.w.r. bridge is handy. It simply takes a bit more cut-and-try. Put the transmitter's controls at the settings normally used when working into an antenna, and then try different coil-tap positions and tuning adjustments in the transmatch until the transmitter loads normally with a minimum of readjustment of the transmitter's controls.

For higher power there are some expedients (which are also useful for low power). Heating elements from household appliances such as irons and toasters will dissipate quite a lot of power. These elements usually have a flat-strip resistance wound on mica cards. While they are far from non-inductive, the inductance is not so high as to make them unusable. It may even be possible to use the appliance as is; the writer has had good results on all bands from 80 to 10 simply by clipping onto the plug terminals of an old-

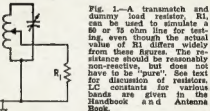


Fig. 1—A transmatch and dummy load resistor can be used to simulate a 50 or 75 ohm line for testing, even though the actual value of R1 differs widely from these figures. The resistance should be reasonably non-reactive, but does not have to be "pure". See text for discussion of resistors. LC constants for various bands are given in Handbook and Antenna Book.

fashioned "no-pop-up" toaster and connecting it directly to the transmitter. The amplifier tank circuit, a pi network having the garden-variety LC constants, handled it just as well as it handled a perfectly-matched transmission line. Any such appliance is worth a try. One having a detachable line cord would appear to have the best chance of working, although it may even be possible to feed the r.f. through the cord in some cases.

## TEST SET-UP

The complete test set-up is shown in Fig. 2. An essential part of it is the "actuator" to substitute for you in your regular capacity as talker on phone or key manipulator on c.w. Actually, you don't need a substitute for c.w. testing since it isn't difficult to operate a key while tuning the receiver and listening. However, if you have an electronic keyer it can be set to make continuous dots, thus letting you have both hands free.

\* Reprinted from "QST," March, 1961.

<sup>1</sup> Grammer, "Looking at Phone Signals," "QST," December, 1962; "A.R.," November, 1963.

<sup>2</sup> Available through Workman T.V. Inc., 309 Queen Anne Road, Yonkers, N.Y., U.S.A.

<sup>3</sup> Tilton, "V.H.F. Dummy Loads," "QST," March, 1960. Geiser, "Wide-Band Moderate-Power Dummy Loads," "QST," December 1958.



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Phone is a different story. You can't talk and do a good job of listening to your signal at the same time. Neither can you hope to enlist someone else's voice for an extended period. What is needed is an untiring source of audio comparable with what you put into the microphone yourself. Also, if you want to use a speaker instead of headphones in your testing it must be a **silent** source. The ideal actuator is a tape recorder. If you have one, as many Hams do, you obviously can record your own voice and do your testing under conditions as close as possible to actual operation on the air. Recorders usually have pre-amplifier or external speaker connections, or both, from which audio can be taken, and it requires no circuit diagram to feed one or the other of these outputs into the microphone jack on the transmitter.

There is one possible hitch—the output voltage level may be higher than is desirable for going into the microphone pre-amplifier. This can be handled, usually, by cutting down the gain in the recorder's amplifier so no

graph is one; there are many 100-per-cent. voice recordings that are suitable for the purpose. The output of a phone pick-up is not generally usable directly, since a crystal or ceramic pick-up ordinarily has too much to simulate a microphone and a magnetic has too little. Here again you can take the output from a pre-amplifier, using an attenuator as in Fig. 3 if necessary. The same type of attenuator can be used directly on a crystal pick-up, with resistances totalling something of the order of 1 to 5 megohms. Shielding is a necessity with such high resistances.

Still another source of continuous talk, or very nearly so, is the a.m. broadcast band. Audio can be taken from the speaker voice-coil terminals in the b.c. receiver, but use caution with small power-line radios. Make sure that neither voice-coil terminal is tied to a "hot" a.c.-d.c. chassis before you try this method. The output voltage problem is the same with the recorder, and should be handled in the same way. One speaker lead will have to be disconnected from the speaker

settings you found optimum for listening to incoming signals.

One further point needs consideration in using the receiver for monitoring. In c.w. and s.s.b. testing (and to a lesser extent with controlled-carrier a.m.) the load that the transmitter puts on the power line varies with the modulation. This may cause the line voltage to fluctuate, possibly with adverse effects on the receiver's stability. To settle this question, use the receiver normally—i.e. with the antenna connected and an incoming signal tuned in. Pick a frequency sufficiently far from your transmitting test frequency so there is no interference from it.<sup>4</sup> Let the transmitter operate into the dummy antenna and watch carefully for any change in best note in the incoming carrier, or shift in naturalness on s.s.b., while your transmitter is being modulated. If the receiver stands this test, you're ready to go. If it doesn't, there is no simple alternative but to try to find an a.c. outlet for the receiver that won't show such large voltage changes. While instability of this sort won't have an appreciable effect on the bandwidth of the transmitter, as measured by the receiver, it can be misleading if you are listening for carrier frequency shift or keying chirps. If there is no way to avoid it you have to discount transmitter stability checks to some degree.

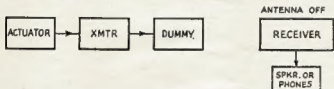
Once you're sure you've eliminated any possibility of receiver overloading and instability, examine your transmitter's signal carefully. Using the highest available selectivity, check the bandwidth as described in the earlier article, and listen particularly for spurious "burps" outside the channel that the signal should occupy. Immediately. As you can readily vary the audio gain in the transmitter while listening, it is no problem at all to find the level at which spurious sidebands start to become noticeable. In turn, this level can be observed on the transmitter's meters. Their readings may surprise you in comparison with what you've been seeing in your ordinary operating. But after a test such as this, they will take on some real significance, where before you had been working in the dark.

To have the most meaning, the actuating signal should be your own voice, which is why a tape recorder makes such an excellent addition to the test gear. If you have to use other voices, try to avoid those having entirely different pitch and timbre. If a radio is the "actuator," scout around among the disk jockeys and compare the results.

Testing in this way doesn't strain finances, but when done intelligently it will give you all the information you need about your signal. If your pals on the frequency miss you for an evening, you'll be all the more welcome when you get back, provided you've cleaned up the things that may have been wrong. This, and the confidence that your transmissions will stand critical examination, should be more than ample payment for the small trouble and the time off the air. ●

<sup>4</sup>If connecting the antenna to the receiver causes feedback troubles, the transmitter can temporarily be put on a different band, preferably higher in frequency, while the receiver is being checked in this way.

Fig. 3. Set-up for using the station receiver for transmitter checking.



stage ahead of the gain control in the transmitter's speech amplifier will be overloaded. If hum becomes bothersome when this is done, it can be overcome by using a simple external attenuator as shown in Fig. 3. R1 should be about 10 times R2, and the sum of the two should equal whatever resistance the pre-amplifier output of the recorder is intended to work into, if the pre-amplifier output is used. As this resistance value is fairly high, shielded wire should be used for the connections, in order to avoid stray hum pick-up. It may also be necessary to shield the resistors, which can easily be done by wrapping them with aluminum foil over a wrapping of paper for insulation, with the foil connected to the shields on the connecting wires.

If the audio is taken from the speaker output terminals, the total resistance may be of the same order as the voice coil impedance, usually around 8 ohms. The value isn't critical, and as long as a low resistance is used, shielding should not be necessary. Needless to say, the recorder's internal speaker should be shut off if you want to listen with a speaker on your receiver.

If you don't have a recorder there are still other possibilities. A phono-

graph is one; there are many 100-per-cent. voice recordings that are suitable for the purpose. The output of a phone pick-up is not generally usable directly, since a crystal or ceramic pick-up ordinarily has too much to simulate a microphone and a magnetic has too little. Here again you can take the output from a pre-amplifier, using an attenuator as in Fig. 3 if necessary. The same type of attenuator can be used directly on a crystal pick-up, with resistances totalling something of the order of 1 to 5 megohms. Shielding is a necessity with such high resistances.

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## THE RECEIVER

A normally shielded transmitter working into a dummy antenna, even if the dummy is not shielded, should not radiate more signal than can be handled by the receiver. No doubt it will be necessary to disconnect the receiving antenna; after all, the "spray" from the transmitter will still be rather strong within a few feet of the set. Here a great deal depends on the overall shielding, both transmitter and receiver, so it is possible to talk only in general terms. Re-read what was said in the earlier article about setting the receiver's controls. You should aim to get the signal pick-up down to the point where you can use about the same gain settings on your own signal as you did on distant signals when the receiving antenna was connected. If the receiver, transmitter and dummy antenna are really well shielded, it may be necessary to use a few inches of wire as a receiving antenna in order to get the needed signal strength. If the signal is too strong, try running the antenna trimmer off tune, and if that doesn't do it, try pulling out the r.f. amplifier tube in the receiver—anything that will let you get a moderately strong signal with the gain

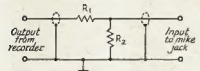


Fig. 4.—Simple voltage divider for reducing audio voltage to a manageable level for the transmitter's speech amplifier. Ordinarily R1 will have about ten times the resistance of R2. A variable control having the same overall resistance can be substituted for the two resistors.

HOW SIMPLE CAN YOU GET?

# A TWO-BAND RECEIVER FOR AMATEUR SERVICE

VOL. MOLESWORTH,\* VK2VO

There is nothing original or clever about this receiver. It was designed and built for a young new Amateur, fresh with his Z call, who wanted a simple and inexpensive receiver to cover the two-metre band and also to tune in Divisional broadcasts on 7146 kc. and callbacks on 7050 kc. It turned out to be such a hot little unit that it was decided to write it up for "A.R." There may be other beginners among who want a simple set. For this reason a fairly detailed description will be given of layout, circuitry, and alignment.

This receiver is presented, also, as an example of the correct use of disposals gear. Except for such "finished" units as BC221 frequency meters, complete receivers and other odd items, most disposals gear needs considerable modification before being of use in the shack. The correct use of this type of equipment, we suggest, is to isolate the components of use, and re-build them on a new chassis, using the relevant portions of the old front panel as a template for a new panel. This has a number of advantages; but to state only two, it enables the new Amateur to standardise on a given chassis size, and the new front panels, painted grey and labelled with Teknical transfers, give a professional finish to the gear—something of which even the fundamentals and XYLs will approve.

This receiver is part of a complete two-metre station, comprising three chassis which will sit one above the other in a tabletop cabinet. At the time of writing, only two of the units have been built and tested—the power supply chassis, which contains two separate power supplies (one for the receiver, the other for the transmitter and modulator), and the receiver chassis. The chassis are 13" x 7" x 2", and the front panels are 14" x 9". The chassis are mounted with half an inch panel clearance at the bottom and at each side.

## THE TUNER

There are six controls and a S meter on the front panel. At the centre is the large tuning knob, calibrated 0 to 100; to the left of the meter is the b.f.o. trimmer; from left to right along the bottom of the panel: the audio gain, meter zero, r.f. gain, and bandswitch.

The bandswitch in one position connects the 40 metre aerial to the primary of the aerial coil of the tuner; in the other position it does three things: (1) it earths the 40 metre aerial, (2) puts high tension on the two-metre converter, and (3) connects the output of the converter to the primary of the aerial coil.

The tuner covers from 4 to 7.5 Mc. The tuning condenser (three gang) and the aerial, r.f. and oscillator coils are taken from an RC8 transceiver. This originally covered from 2 to 4 Mc., and

from 4 to 10 Mc., in two switched bands. We took only the higher frequency coils and by adding capacity across the gang, and twiddling the coil slugs, brought them down to a top limit of 7.5 Mc. Similar coils are found in a number of disposals transceivers, such as the No. 19, 122, etc.

One stage of r.f. amplification is used, a 6BA6, but a 6U7 would do as well. The converter is a 6K8, and there is only one stage of i.f. (a 6BA6, or 6U7). The two i.f. cans at 455 kc. are taken from a disposals receiver, as is the 455 kc. b.f.o. coil and tuning capacitor. The detector is a 6AV6 and the audio output a 6AQ5, but a 6SQ7 and 6V6 would do just as well.

We used one half of a 12AT7 for the b.f.o. and the other for an S meter amplifier. The S meter, by the way, came from a 522 test set. Removed from its tin box, it is found to have an attractive face calibrated 0 to 9, which is ideal for S points. The antenna sockets and the speaker jack on the rear of the chassis are also ex disposals.

First, identify the coil windings on the aerial, r.f. and oscillator coils. When you are quite certain of the connections, remove them from the transceiver, open them up carefully, and renew the wires, carefully noting the colour coding. We used red for B+, pink for plates, blue for grids, and green for earth or a.v.c.

Next, remove the tuning condenser and mount it on the chassis so that its shaft comes out exactly in the centre of the panel, which should be first attached to the chassis. The height of the shaft will depend on the dial you are going to use, but almost certainly this will be a vernier, so allow room for it. Cut three large holes beneath the tuning condenser to allow connection to the three sets of fixed plates.

The aerial coil, 6BA6, r.f. coil and oscillator coil are mounted down one side of the condenser, to afford short connections from the grid windings to the fixed plates in each section.

The mixer valve is mounted alongside the oscillator section of the gang on the other side. Leave enough room for the moving plates to open fully. In front of this are mounted the first i.f. coil, 6BA6, and 12AT7. The second i.f. coil and the b.f.o. coil are mounted in Indian file next to the 12AT7, and alongside them again, the detector valve, audio valve, and speaker transformer. The detector valve is placed at the front of the chassis to be near the audio gain control.

The circuit of the 4-7.5 Mc. tuner is quite conventional. The secondary of the aerial coil is connected between grid pin 1 of the 6BA6 and earth. Pins 2 and 7 (suppressor and cathode) are linked, by-passed with a 0.1  $\mu$ F. capacitor, and connected by a 100 ohm resistor to the top of the 5,000 ohm r.f. gain pot. The screen (pin 6) is also by-passed with a 0.1  $\mu$ F. and connected

to B+ through a 47,000 ohm resistor. The plate (pin 5) is capacitively coupled to the grid of the 6K8 through the gang, has an r.f. choke in series with a 10,000 ohm resistor to B+, by-passed at their junction with a 0.05  $\mu$ F. capacitor.

Signal is fed to the 6K8 converter valve, which is housed in an ex-disposals shield can, through the top cap grid. The cathode (pin 8) is earthed, and the screen (pin 4) by-passed with a 0.1  $\mu$ F. and connected to B+ through a 47,000 ohm resistor. The oscillator plate (pin 6) and grid (pin 5) are connected to the appropriate oscillator coil windings through small value capacitors. The oscillator plate is fed with 150 volts regulated from a VR150 in the power supply, decoupled with a 10,000 ohm resistor and 0.1  $\mu$ F. capacitor. (Unless this network is included, the oscillator will shift frequency if the cable connecting the receiver and power supply chassis is moved.)

The 6K8 plate (pin 3) is connected to the primary of the first i.f. transformer, the other end of this winding being by-passed with a 0.5  $\mu$ F. and connected to B+ through a 4,700 ohm resistor. The secondary of the transformer is connected to grid pin 1 of the 6BA6 i.f. amplifier valve, the other end of the winding being by-passed with a 0.05  $\mu$ F. and connected through a 100K resistor to a.v.c. The cathode and suppressor (pins 2 and 7) are earthed; the screen (pin 6) by-passed with a 0.1  $\mu$ F. and connected to B+ with a 50,000 ohm resistor, and the plate (pin 5) connected to the primary of the second i.f. transformer, the other end of this winding being by-passed with a 0.05  $\mu$ F. and connected to B+ through a 4,400 ohm resistor.

One end of the secondary of the second i.f. transformer is connected to diode pin 6 in the 6AV6, the other end passing through a 50K and a 500K resistor in series to earth. The bottom of the winding and the junction of the two resistors is by-passed with a 100 pF capacitor, and from the junction audio is taken off through a 0.02  $\mu$ F. capacitor to grid pin 1, which has a 5 megohm grid leak.

A 100 pF. capacitor is connected between diode pins 5 and 6, and from pin 5 the a.v.c. voltage is developed. In the usual manner, a one megohm resistor is connected from pin 5 to earth, and another one megohm placed in series with the a.v.c. line, at the other end of which a 0.05  $\mu$ F. capacitor is wired to earth. (Varying the value of this capacitor will vary the speed of the a.v.c. system.)

The audio section of the 6AV6 has the cathode earthed and a 120K ohm plate resistor. Audio is fed to the top of the volume control (a 500K pot.) through a 0.02  $\mu$ F. capacitor, and the moving arm goes to grid pin 1 of the 6AQ5. This is also wired conventionally, the cathode (pin 2) having a 300 ohm 3 watt wire wound resistor and

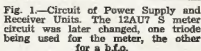
\* 2 Bass Street, Kingsford, N.E.W.



A four-pin socket is used for the cable connecting to the power supply. Four pins are required for B+, 150 volts regulated, filament plus, and earth.

With the 7777 Kc. crystal plugged in the main shaft was tuned for maximum output at 139.9 Mc., and the shaft then locked into position. The trimmers on the frequency multiplier were adjusted for maximum oscillator output. In the mixer, a one megohm resistor was wired from grid to earth (replacing the negative bias voltage), a 15,000 ohm resistor placed in the plate circuit, and a 6C4 cathode follower wired in. The cathode follower has a 47K grid leak, 1,500 ohm

To align the aerial and r.f. coils, pump signal at 4 Mc. into the aerial with the gang fully meshed, and adjust



We had quite a lot of fun calibrating the two metre band, having logged to

(Continued on Page 10)

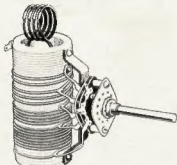
## R.F. CABLES

RC58-AU 50 ohm Coaxial .. 2/6 yd.  
 PT9M 50 " " " 1/10 yd.  
 PT8M 50 " " " 4/6 yd.  
 PT1M 70 " " " 2/6 yd.  
 PT9M 70 " " " 5/- yd.

"Low Loss" Open 300 Ohm Trans-  
 mission Cable, 46/- 100 ft. coils  
 K20 72 ohm Twin Flat .. 1/1 yd.  
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Above Prices subject to 12½% Sales Tax.

## PI-COUPPLERS



### WILLIS MEDIUM POWER TYPE

For use up to 600 watts p.p. Match plate loads of 2,000 to 3,500 ohms (Z) and higher into coaxial cable. Operating Q increases on higher frequencies to increase harmonic suppression, enabling practical values of tuning capacity to be used on 10 and 15 metres and allowing for wiring inductance (L). Incorporates additional switch section for shunting additional capacity (C) if required, or switching other circuits. Switch rated for 10 amps. at 3,000 volts with contact resistance (R) of 0.8 milli-ohms.

Price: £3/19/6 (inc. S.T.)

### WILLIS PI-COUPLER CHOKE

To suit above Pi-Coupler. No resonances within Amateur bands if spaced diameter or more from metal panels. Stands 6 inches high on 1 inch diam. ceramic former. Base mounting bracket included.

Price: 25/- (inc. S.T.)

### GELOSO PI-COUPPLERS

Type 4/11 for use with parallel tubes type 8146, 807s, etc.

Type 4/112 for use with single ended tubes type 8146, 807, etc.

Both Types, Price: 39/6 (inc. S.T.)

### EDDYSTONE 250 pF. CONDENSERS

Type 817 condenser, suitable for use with input of all above Pi-Couplers. Rated 1,200 volts r.m.s., ceramic insulation, fit space 3 inches square by 2½ inches deep. (Output condenser smaller small two or three gang b.c. condenser.)

Price: 45/- (inc. S.T.)

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SPECIAL SIZES MADE TO ORDER

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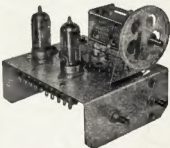
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SAVES TIME — GIVES PROFESSIONAL APPEARANCE

SIZES	SIZES
1/2 inch — 27/11	1-1/2 inch — 46/6
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7/8 inch — 30/10	2-3/25 inch — 72/2
1 inch — 36/7	2-1/2 inch — 65/9
1-1/8 inch — 36/7	11/16 in. Square 65/4
1-1/4 inch — 36/7	1 inch Square 65/4
1-5/8 inch — 40/6	21/32 x 1 1/16 in. Rectangular 76/3

The "Q-Max" range of Screw Type Chassis Cutters serve a most useful purpose where holes are to be punched on chassis where components are already mounted. The SQUARE and RECTANGULAR punches save the hard work involved in transformer, plugs and sockets, L.F.s., etc., cut-outs.

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Model 4/104 V.f.o. Unit. Tunes six Amateur bands. Uses 6CL6 and 8763 valves. Supplied complete with handsome calibrated dial, pointer and perspex escutcheon. (Valves extra.) Notes on circuit application and operation upon request.

Price: £10/5/- plus 12½% S.T.

## WILLIS AIR-WOUND INDUCTANCES

No.	Diam.	T.P.I.	B. & W. Equiv.	Price
1-08	1"	8	No. 3002	5/3
1-16	1"	16	No. 3003	5/3
2-08	1"	8	No. 3006	6/3
2-16	1"	8	No. 3007	6/3
3-08	1"	8	No. 3010	7/4
3-16	1"	8	No. 3011	7/4
4-08	1"	8	No. 3014	8/5
4-16	1"	16	No. 3015	8/5
5-08	1 1/4"	8	No. 3018	10/6
5-16	1 1/4"	16	No. 3019	10/6
8-10	2"	10	No. 3907	13/9

### SPECIAL ANTENNA ALL-BAND TUNER INDUCTANCE

(equiv. B. & W. No. 3907-7")

7" length, 2" diam., 10 t.p.i., 24/6

References: A.R.R.L. Handbook, 1961;  
 "QST," March 1959;  
 "Amateur Radio," Dec. 1958.

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List No.	Audio Watts	RF Inp. Watts	Price inc. sales tax
UM9	10	20	£5/16/0
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UM2	60	120	£10/13/3
UM3	120	240	£12/2/6
UM4	250	500	on application

## GELOSO 2620A FRONT-END RECEIVER TUNING KIT

Covers All Amateur Bands.  
 Price: £25 plus 25% Sales Tax  
 (Please add 10/- Freight and Packing)

# WILLIAM WILLIS & CO. PTY. LTD.

428 ELIZABETH STREET. MELBOURNE, C.1

Phone 34-6539

# AN EASY WAY OF LOGGING FOR R.D. CONTESTS

HOW do you make out, keeping track of whom you had worked and on which band, during the last R.D. Contest? Well if you had trouble like I did in 1961 and 1962, this may interest you.

I have tried many different methods, all of which have had many pitfalls and have proved highly unsatisfactory. Now let's reminisce over the last three years. Take 1961 for instance. Well, with 350 QSOs we ended up in quite a mess. I tried taking a slip of paper for each call area and as time went by I tried desperately to place in alphabetical order the stations worked. At the same time we ticked the adjacent columns representing the various bands. Alas, this was "no chop" as to speak. Sheer bedlam; as time went by it was obvious that the "system" was breaking down. Many the time was the reply, "sorry OM have worked."

Now in 1962 we really had it organised. It seemed, oh so simple, just obtain one of those "ideal desk calendars" and on working each station you arrange them in alphabetical order with call sign on top, band and your number alongside (i.e. 801). What a set-up. Couldn't miss. Just imagine the words spoken when the "Board of Control" in all her glory charged through the door, cup of tea in hand. The draught caused the papers to fly . . . Never mind, enough said!

Well it was close to the 1963 Contest and the position was desperate, something had to be found and found fast, too! Let us consider the basic requirements.

1. Something very simple and fast. (And probably most important.)
2. Not many pieces of paper.
3. Able to tell at a glance said station on that band.

I decided that you knowing what number you gave to a certain station was irrelevant if the "system" was "fool proof". Well enough of the preamble, here is how it works.

First of all you take, say, six pieces of paper about 15 inches square, and divide it into half-inch squares. Label it A-Z across the top, and A-Z vertically (downwards) with both "As" corresponding. See Fig. 1.

VK3 CALL AREA					
A	B	C	D	→	Z
A					
B					
C					
D					
↓					
Z					

Fig. 1.

Label each piece of paper to represent the various call areas. Obviously you don't have to make up a sheet for your own call area, and suggested groupings are as follows: VK1 and VK2, VK3, VK4, VK5/8, VK6, VK7, VK9 and VK0.

Now if you work a station on 80 mcs you could use various colours, for designation, or do as I did, simply use the figure 8. For the other bands use 4 for 40 metres, 2 for 20 metres, 1 for 15 metres, and anything for the other bands.

Here's how it works. Let's take all possibilities. Say you work VK3AB on 40 metres. Remember always that the first letter of the call sign indicates the horizontal direction and the last letter indicates the vertical direction. It is hence logged as in Fig. 2, i.e. along A, down to B, with 4 meaning 40 metres.

VK3 CALL AREA					
FIRST LETTER					
A	B	C	D	→	Z
A					
4					
B					
C					
D					
↓					
Z					

Fig. 2.

4 = VK3AB on 40 metres.

Now if you work VK3AAB on 40 metres, you would log as shown in Fig. 3. The "A" indicates the first letter and the same procedure is followed as for VK3AB. Get the idea? Simple, what?

You may well ask how to distinguish between VK0 and VK9 or VK1 and VK2 on the same sheet. This I leave to you and you could do as I did with say VK9AB and VK0AB (the possibility being fairly remote)—use different colours (red and blue biro respectively).

Well, in conclusion, I must say if you are careful and don't get the call areas mixed up, you will find the method highly satisfactory, extremely quick (able to call a station after checking in time before he has finished his CQ). Also it provides a good method of checking your final score, by simply counting up the number of 2, A2, etc., and multiplying that total by points for that call area.

The half-inch squares do not get too cluttered as 400 QSOs proved.

A fact is that he who knows whom he has worked whilst tuning the band, quickly generally nets high scores, everything else being equal.

Anyway, chaps, I hope this "system" is of some help to you and personal modifications can be made to suit the occasion.

Best of luck and high scores in the R.D. Contest.

VK3 CALL AREA					
FIRST LETTER					
A	B	C	D	→	Z
A					
A4					
B					
C					
D					
↓					
Z					

Fig. 3.

A4 = VK3AAB on 40 metres.

N.B.—The "A" takes form of the middle letter. That is, "B4" for VK3ABB.

—Doug. McArthur, VK8KK,  
— . . . . . ex-VK8KK

## ELECTRICITY IN AUSTRALIA

This year, 1963, we celebrate the centenary of the first use of electricity in Australia, produced by batteries at the Sydney Observatory in June 1863. It is worth noting that in Australia, Tamworth (N.S.W.) had the distinction of being the first town to be lighted by electricity—this was in 1888. The records of progress reveal, strangely enough, that Sydney, in 1904, was the last of the capitals in this country to be electrically lighted.

—WIA-L3042/BERG192.

## S.S.B. CRYSTALS

Set of Five Gold-Plated  
Matched Crystals

Mounted in HC6U Holders  
Suitable for 455 Kc. I.F.s

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# RESULTS OF 1963 R.D. CONTEST

## QUEENSLAND'S FIRST WIN

**HONOURS** for this year's Remembrance Day Contest go to Queensland for having won the trophy for the first time in the history of the Contest. The log return from VK4 was the highest ever for Queensland, and this is the contributing factor to the winning of the Remembrance Day Contest.

Generally, the standard of the logs was good and the Western Australian Division are to be commended in that all logs submitted were on the official W.I.A. log sheets. Unfortunately there are still a few logs below the required standard which were tolerated, but in future logs not up to standard will be disqualified. Several of the listeners' log received showed very little knowledge of the Contest Rules by the contestants.

All sections of the Contest were keenly contested and some fine individual scores were recorded. South Australia had the highest log average whilst Western Australia had the highest

percentage participation. High scoring seems to be a regular occurrence from South Australia. Conditions for the Contest were not first rate and there was a lot of activity on the low frequency bands during night time operation. Another interesting feature of the Contest is the increasing activity on single sideband. This mode of operation is on the increase and a lot of contestants used it to their advantage on 80 metres.

The scoring system for the Contest appears to suit the contestants in all States, and it is indeed a pity that the two larger States cannot have a larger percentage of Amateurs participating in the Contest and submitting logs.

In conclusion, our congratulations once more to Queensland and hope that in next year's Contest we may see even more Amateurs on the air, particularly from New South Wales and Victoria.

—Federal Contest Committee, W.I.A.

### NEW SOUTH WALES

Top Six Logs—		1203 points
VK2AHM	2RS	938
2AHM	915	915
2BO	802	802
2ABA	733	733
2DO	659	659

Open—			
Call	Cont.	Pt.	
VK2AHM	441	1203	
2BO	301	892	
2DO	323	629	
2VN	168	486	
2EL	138	427	
2AGS	118	327	
2YL	91	206	
</			

Phone—			
Call	Cont. Pt.	Call	Cont. Pt.
VK1RS	323 935	VK2AEC	52 83
2ARH	324 913	2VH	44 84
2ABA	282 733	2OE	30 76
2ANO	211 604	2AIA	17 70
2TS	234 467	2AI	41 68
2FE	170 600	2CT	24 66
2ALV	187 332	2APQ	40 63
2AFD	140 345	2KT	30 62
2AES	123 305	2RU	23 61
2AXL	105 290	2RJ	30 61
2ARU	120 247	2AKX	35 61
2APF	81 222	2AKV	12 50
2APJ	181 213	2AKL	11 50
2RX	96 206	2ASC	35 40
2RD	95 206	2ALA	30 38
2DM	77 187	2AWA	13 27
2AGZ	78 158	2AAJ	5 26
2GI	89 149	2CU	7 23
2CS	83 148	2AAH	11 23
2CM	80 140	2AWN	11 23
2AQX	87 137	2RA	9 22
2AIM	45 123	2AVK	10 22
2JN	50 123	2EE	6 18
2YN	53 122	2LA	10 18
2AJQ	52 107	2WG	10 18
2EM	45 106	2ACO	10 14
2AUL	38 106	2OT	8 12
2LV	44 103	2ADA	9 12
2RV	48 103	2ACQ/P	7 12
2AT	34 96	2ACQ/P/Log	7 12
2AGH	33 96	2AKS	disqualified
2APO	33 96		

### DETAILS OF STATE SCORES

	Total State Score	Aver. Log	Licenses	Log Entry	Percentage	State Aver.	Total State Points
New South Wales	18,162	869	1,427	107	7.4	169.7	2,230
Victoria	15,819	674	1,392	89	4.9	229.2	1,458
Queensland	16,564	469	469	99	21.1	167.3	4,197
South Australia	19,145	912	545	82	15.0	233.4	3,792
Western Australia	11,711	653	317	88	27.7	133.0	3,904
Tasmania	5,491	508	184	38	23.1	144.5	1,780

### STATE TROPHY

Queensland	4,197 points
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### Highest State Log Average

South Australia	233.4 points
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### Highest Individual Score

VK5ZP	1,440 points
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### Award Winners

#### Open—

VK1AB—G. Chisholm	22 pts.
2AHM—R. J. Whyte	1,205 "
3ALZ—I. F. Berwick	826 "
4DJ—G. F. Pooley	778 "
5ZP—J. McL. Vale	1,440 "
6RU—J. E. Rumble	727 "
7DK—D. H. Kelly	478 "

#### Phone—

VK1VP—E. Peniks	311 pts.
2RS—D. C. Haberecht	935 "
3MO—J. J. Williams	737 "
4WW—N. B. Walden	658 "
5WI—Operator VK5KK	1,032 "
(D. A. McArthur)	1,032 "
6CL—J. H. Clinch	867 "
7AI—K. M. Saxon	857 "

#### C.W.—

VK1SG—T. A. Brinkley	145 pts.
2QL—F. T. Hine	883 "
3AXK—S. R. Coleston	448 "
4VR—L. D. Rickaby	386 "
5ZC—A. J. Penney	472 "
6SM—M. H. Saw	361 "
7SM—S. G. Moore	501 "

#### Receiving—

VK1—A. Davis	389 pts.
12211—R. C. Abernethy	883 "
L3138—G. N. Earl	717 "
VK4—K. Chilverton	506 "
L5015—W. J. Clayton	736 "
L6021—P. W. Drew	980 "
VK7—G. C. Johnston	851 "

### AUST. CAPITAL TERRITORY

#### Open—

Call	Cont. Pt.
VK1AB	7 33

#### Phone—

Call	Cont. Pt.	Call	Cont. Pt.
VK1VP	123 311	VK1RS	31 81
1AWU	51 186	1RS	11 49
1ACA/Log	10 13	1GB	10 13
1RM	97 182	1ML	8 12

#### C.W.—

Call	Cont. Pt.
VK1SG	61 145

#### C.W.—

Call	Cont. Pt.	Call	Cont. Pt.
VK1QL	138 407	VK1QY	53 80
2APK	105 377	2EJ	53 77
2YS	91 363	2JM	53 77
2GT	71 300	2PQ	50 88
2XQ	85 171	2GW	18 48
2EO	45 125	2HZ	10 34
2LF	45 124	2T	12 23
2ZC	38 109	2IV	10 29
2SU	38 106	2ASJ	5 19
2PU	40 92	2ADG	6 11

### VICTORIA

#### Top Six Logs—

VK1ALZ	1203 points
2MO	938
3TL	915
3AZZ	802
3OM	733
3AIT	659

#### Open—

Call	Cont. Pt.	Call	Cont. Pt.
VK1ALZ	385 866	VK1QV	102 232
3TL	291 895	3AKN	103 218
3AZM	158 420	3AST	98 183
2ZCB	101 238	3HL	24 80

#### C.W.—

Call	Cont. Pt.	Call	Cont. Pt.
VK1AJK	185 448	VK1KN	21 40
3XB	171 428	3YS	20 47
3RJ	99 222	3LC	20 46
3APJ	53 108	3YE	20 46
3ARX	37 98		

# Phone—

# Open—

# C.W.—

Call	Cont. Pt.	Call	Cont. Pt.	Call	Cont. Pt.
VK2MO	246 737	VK3TQ	81 183	VK3PZ	277 1440
2A2Z	251 730	30DY	49 166	30SV	271 120
30M	256 603	3ANV	89 181	6TC	244 588
3AIT	265 557	3PW	38 130	5AN	213 504
3AT	125 463	3ACD	62 128	6TU	200 508
3ATH	123 448	3KE	62 128	6RG	184 508
3ARJ	147 432	3ZQ	54 111	3QR	100 284
3RV	157 418	3VZ	46 109		
3WV	150 413	3ANV	89 181		
3WK	143 397	3ANQ	41 84		
3AFJ	164 387	3ARQ	32 78		
3AL	151 378	3AM	32 69		
3AH	180 335	3WM	23 63		
3LW	120 333	3BA	29 63		
3ZU	141 333	3PW	28 58		
3ALV	121 326	3JTE	14 50		
3HG	113 300	3VF	17 51		
3ASN	145 288	3AWF	9 28		
3ABP	120 283	3AQL	32 40		
3SM	104 263	3KX	22 25		
3AKX	101 248	3ARA	6 14		
3VL	78 242	3AGD	7 11		
3AWT	100 218	3AKW	8 11		
3AYD	81 210	3AHT	11 11		
3GC	58 190	3AFP	10 10		
3HC	70 183				

## QUEENSLAND

### Top Six Logs—

VK4DJ	—	—	778 points
4RH	—	—	758 "
4UX	—	—	758 "
4FW	—	—	758 "
4HC	—	—	758 "
4ET	—	—	758 "

### Open—

Call	Cont. Pt.	Call	Cont. Pt.
VK4DJ	251 730	VK4TH	79 153
4RH	258 789	4CK	47 134
4UX	288 789	4PU	47 134
4TY	196 818	4CB	18 63
4VW	121 792	4BB	9 11
4DB	77 196		

### Phone—

Call	Cont. Pt.	Call	Cont. Pt.
VK4WV	219 659	VK4AO	13 60
4HC	217 659	4RA	27 60
4JQ	215 606	4XO	21 60
4RZ	214 600	4XO	21 60
4QZ	213 609	4AQ	23 50
4CP	210 642	4Z	39 55
4OR	197 610	4D	16 54
4CE	181 484	4CZ	24 51
4FY	177 435	4JW	29 47
4BQ	167 423	4VL	16 46
4JY	145 413	4FJ	20 46
4LB	132 376	4RL	28 45
4MW	114 369	4RG	31 44
4NB	92 367	4LW	18 38
4HM	72 303	4ZM	10 31
4QC	65 248	4MK	8 30
4PS	61 208	4BC	8 30
4BA	60 190	4FV	11 29
4AN	78 171	4NG	9 28
4OL	70 168	4FE	12 27
4WP	67 165	4B	12 27
4LN	60 164	4OF	13 27
4Z2	58 148	4MH	7 26
4KM	58 147	4HD	7 26
4BS	41 145	4D	12 25
4LB	40 137	4FV	14 23
4DA	35 133	4ST	9 20
4C	46 130	4GW	8 17
4CZ	40 113	4PS/Log	
4WV	31 105	4MT	10 18
4LA	31 85	4QW	6 14
4AF	24 84	4SX/P	6 14
4ES	31 82	4VL	6 12
4FN	38 81	4NS	8 12
4B	29 80	4L	11 10
4WQ/Log		4ZV	7 11
4LN	32 78	4FR	9 11
4DD	29 78	4RZ	11 11
4DB	25 72	4OG	10 10
4WS	23 80		

### C.W.—

Call	Cont. Pt.	Call	Cont. Pt.
VK4VR	146 306	VK4BL	11 24
4HX	83 248	4OJ	8 17
4JY	85 223	4CH	8 14
4LW	81 164	4LY	8 11
4XP	80 118	4XL	8 9
4KX	31 58		

## SOUTH AUSTRALIA

### Top Six Logs—

VK3PZ	—	—	1440 points
3WV	—	—	1353 "
3ZK	—	—	888 "
3BQ	—	—	749 "
3FT	—	—	715 "
3WC/Log	—	—	588 "

### Phone—

Call	Cont. Pt.	Call	Cont. Pt.
VK3VJ	400 1032	VK3SE	64 101
3ZK	316 858	3SZ	82 150
3WV	271 748	3XZ	87 145
3FT	260 715	3CH	54 137
3WC/Log		3MT	90 136
3ZK	258 693	3ZQ	69 130
3WV	203 658	3D	66 138
3GZ	168 430	3WH	46 131
3TM	149 351	3OC	36 112
3NN	146 349	3KY	25 104
3EQ	101 341	3UF	47 103
3LQ	108 335	3EB	19 77
3MF	123 323	3EP	59 52
3AX	127 313	3UX	31 37
3TN	125 302	3EH	32 34
3HQ	86 312	3PR	30 33
3NN	100 299	3ON	15 30
3LL	100 290	3CU	15 30
3TJ	73 338	3OZ	17 30
3LN	84 212	3CO	8 28
3RC	82 203	3D	13 29
3BG	48 174	3WC/Log	
3RR	56 187	3TH	18 26
3DF	56 186	3WC/Log	
3CL	51 148	3BV	8 23
3LC	85 156	3CJ	19 23
3SS	74 155	3PM	13 18

### C.W.—

Call	Cont. Pt.	Call	Cont. Pt.
VK3ZC	177 472	VK3PO	61 82
3LD	124 257	3O	30 76
3MY	89 254	3KU	19 45
3PC	108 233	3JQ	15 26
3FE	93 163	3RK	8 28
3LQ	118 158	3LC	8 28
3OR	93 112	3BS	17 23
3TL	91 89	3FO	8 19
3KI	23 84	3BM	7 14

## WESTERN AUSTRALIA

### Top Six Logs—

VK3CL	—	—	891 points
GRU	—	—	791 "
6MK	—	—	691 "
6KW	—	—	580 "
6WT	—	—	536 "
6PR	—	—	503 "

### Open—

Call	Cont. Pt.	Call	Cont. Pt.
VK3RU	255 787	VK3YK	28 174
6MK	276 691	6WI	33 91
6KW	253 690	6JX	38 91
6VT	202 638	6LR	31 60
6PH	302 608	6BA	30 73
6BE	195 408	6NP	10 23
6CW	166 371	GRU/Log	
6WU	118 305	6AW	2 18

### Phone—

Call	Cont. Pt.	Call	Cont. Pt.
VK3CL	316 807	VK3RH	17 29
6RY	197 807	6VZ	16 27
6RX	170 438	6WV	15 36
6RE	144 383	6TF	15 34
6LA	138 377	6LM	12 33
6RX	112 375	6DM	12 33
6X	83 314	6MA	13 30
6AV	74 293	6YL	10 28
6XO	72 181	6X	12 28
6JX	62 183	6LG	12 28
6RH	56 161	6HO	8 26
6XG	53 144	6TR	13 26
6TX	37 107	6AG	6 23
6TK	35 102	6NZ	6 23
6DI	33 84	6MR	7 31
6MO	30 83	6AB	9 19
6RY/Log		6GH	7 18
6CA	33 77	6SI	7 18
6CP	26 77	6TL	8 17
6CJ	28 66	GRU/Log	
6KH	28 64	6WR	8 18
6DD	23 59	GRU/Log	
6KS	23 58	6WM	7 16
6DN	23 57	6VZ	16 27
6CR	23 56	6OY	8 16
6DX	21 81	6HK	8 15
6RW	19 46	6X	8 15
6TM	19 46	6XZ	6 13
6RD	18 44	6DL/Log	
6TB	18 44	6DP	7 11
6AF	18 43		

## TASMANIA

### Top Six Logs—

VK7AI	—	—	657 points
7XZ	—	—	601 "
7DM	—	—	601 "
7DX	—	—	478 "
7KA	—	—	461 "
7PA	—	—	371 "

### Open—

Call	Cont. Pt.	Call	Cont. Pt.
VK7DK	230 478	VK7JB	17 40
7KA	161 451	7LZ	17 34

### Phone—

Call	Cont. Pt.	Call	Cont. Pt.
VK7AI	254 657	VK7DR	22 46
7XZ	252 602	7LZ	20 31
7BP	168 372	7CT	27 35
7KH	123 337	7BQ	11 31
7LZ	120 345	7AB	7 28
7MK	116 301	7AB	7 28
7BS	87 185	7DW	9 26
7TT	67 184	7MK/Log	
7CK	37 108	7LZ	9 19
7KS	65 102	7DR/Log	
7RK	22 95	7JP	13 18
7BS/Log		7TD	6 12
7ES	33 62	7KS/Log	
7ZW	30 59	7DS	8 10

### C.W.—

Call	Cont. Pt.	Call	Cont. Pt.
VK7BM	179 861	VK7LJ	20 57
7RY	84 190	7RK	12 28
7BQ	30 28	7AD	11 23
7CJ	31 78	7C	8 8
7OV	37 16	7CH	5 14

## PAPUA/NEW GUINEA AND TERRITORIES

### C.W.—

VK8DR	—	—	198 points
6MV	—	—	8 29
6AT-Check Log			

## ANTARCTICA

Call	Cont. Pt.
VK9VK	94 384

## RECEIVING SECTION

### Australian Capital Territory

A. Davis	—	—	889 points
R. Davis	—	—	848 "
J. Watson	—	—	167 "

### New South Wales

W1A-1321-R. C. Abernethy	—	—	883 points
13033-D. W. Shepherd	—	—	811 "
R. Bowden	—	—	540 "
R. Breckley	—	—	326 "
12022-D. Grantley	—	—	305 "
12841-T. K. Stewart	—	—	303 "
12644-A. Miller	—	—	303 "
12559-P. Vernon	—	—	292 "
12801-B. J. Smyth	—	—	187 "
P. Robinson	—	—	66 "
13233-R. B. Macintosh	—	—	44 "

### Victoria

W1A-1318-G. N. Earl	—	—	717 points
C. Shaw	—	—	890 "
G. Baker	—	—	977 "
G. H. Hunt	—	—	558 "
13125-D. James	—	—	519 "
13187-R. P. Gething	—	—	501 "
M. Byrne	—	—	467 "
P. R. Nesbit	—	—	395 "
13078-J. M. Hillard	—	—	383 "
G. Harrison	—	—	303 "
13104-N. Duncan	—	—	358 "
A. J. Wilson	—	—	329 "
13043-E. W. Treblecock	—	—	318 "
R. Field	—	—	277 "
C. G. Thompson	—	—	276 "
12055-M. R. Cox	—	—	271 "
13158-L. Harrison	—	—	267 "
13163-R. Ross	—	—	150 "
K. D. Schuhen	—	—	167 "
13164-P. Gibson	—	—	70 "
13089-J. Johnson	—	—	58 "

(Continued on Page 14)



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Hammer Type. Locally made and guaranteed. Set of three, 8", 8", 1-3/16".

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No. 314 Turret Pin 7d. doz.

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80/- + S.T. 12½%

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R.F. Output: Over 100,000 Microvolts.

R.F. Control: Variable with two taps.

Modulation Frequency: 400 c.p.s.

A.F. Output: 2-3 Volts.

A.F. Input: Approximately 4 volts.

Valves used: One 12BH7 and one 6AR5.

Size: 6½" x 10" x 4½". Weight: 6 lbs.

Price £12/16/- + S.T. 12½%

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# MICROWAVE TESTS

On 25th May, 1963, a group comprising VKs 3ZOV, 3ZAF, 3ZMQ, 3ZKC/T and Peter McKenzie carried out a series of microwave tests between Mt. Dandenong (2,040 ft. above sea level) and a point 18 miles away at Highbett (140 ft. above sea level). All obstacle clearance criteria were satisfied and path opticality was also verified by sending a light beam from Highbett to Mt. Dandenong with a 20-inch searchlight reflector. Stabilised equipment operating on the 3,300 Mc. allocation was used to determine the following:—

- (1) Median path attenuation.
- (2) Deepest fading over this short-term test period.
- (3) Path reliability using the result from (2).
- (4) Gain of several parabolic antennae and yagi systems.
- (5) Diffraction loss over trees of a green cross-section and height and agreement of theoretical diffraction loss with that obtained here.
- (6) Maximum available signal/noise ratio for a baseband of 4 Mc. (i.f. bandwidth 10 Mc.) and comparison with predicted figures.
- (7) The effects of system non-linearity due in part to (a) natural multipath propagation, (b) deliberately introduced multipath signals, as compared with test-bench linearity performance.

Parts (6) and (7) were intended mainly to help evaluate the overall long-distance behaviour of a flying-spot scanner video system which has so far only been used in conjunction with this equipment over a much shorter distance.

The 3K Mc. f.m. transmitter comprises a 100 mW. temperature-controlled klystron (726A) with an electronic regulated power supply. Fre-

quency stabilisation ( $\pm 0.01\%$ ) is absolute, using a temperature controlled reference cavity and a negative-feedback control loop. The klystron is matched to its load by means of a coaxial dielectric double slug tuner, giving a residual v.s.w.r. not greater than 1.5. A 3K Mc. a.m. transmitter is now available which delivers an average output power of 50w. and a peak power output of 45kw. using pulse modulation.

The 3K Mc. receiver uses a single-ended coaxial crystal mixer with matching facilities and a temperature controlled local oscillator klystron. The L.O. may be reference cavity stabilised as before, or "locked" to the transmitted signal. Twelve i.f. stages follow the mixer, including three limiters and a wide-band discriminator. Base-band (4 Mc) and single voice channel (10 Kc. bandwidth) amplifiers with cathode follower output, together with a receiver tuning error-signal feedback loop follow the discriminator. This mixer-i.f. chain combination is in duplicate for space or frequency diversity facilities. The receiver noise figure is 14 db. with r.f. preselection, good mixer matching and approximately 500  $\mu$ A. of crystal current.

Equipment for 5K Mc. is similar but uses a Heil tube transmitter delivering 500 mW., or alternatively an a.m. c.w. magnetron delivering some 300 mW., with a wide-band a.m. i.f. strip. The 10K Mc. system using 723A/B klystrons and wave guide r.f. components is essentially similar to the 3K Mc. system, but with a power output of only 15-20 mW. when the klystron tuning struts are modified.

The antenna system is common to all bands and consists of one or two 4 ft. tripod-mounted paraboloids with dipole or horn wave guide feeds as required.

The equipment at both ends is basically similar, and both are capable of handling a video signal on all microwave bands. Mains and all h.t. supplies to this equipment are stabilised. This is essential for avoiding unnecessary errors in the path analysis. Available test equipment includes power measuring bridges, a standard horn, a slotted line, frequency meters and calibrated attenuators.



Mt. Dandenong gear and John VK3ZAF. Not shown, but present, was Peter McKenzie.

For the Mt. Dandenong test, the overall discrepancies between theoretical and actual results were not greater than  $\pm 3\%$ . The path attenuation at 3K Mc. was measured as 134 db. with a maximum recorded fade of 12 db. The maximum available (unweighted) base-band S/N was 38 db. The single voice channel f.m. improvement over



Gear at Highbett. Left to right: Martin VK3ZOV, Michael VK3ZKC/T, and Graham VK3ZMQ

Wireless Institute of Australia  
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this figure was approximately 20 db. In these tests a two-channel, six-speed strip chart recorder was used at the Mt. Dandenong end. One tree in the far-field of the antenna caused a diffraction loss of 15 db., and measured absorption losses for several bushes and trees were also in this region.

The r.f. portion of the link was initially adjusted at both ends by means of frequency meters, whilst prismatic compasses were used for dish alignment. Some fifteen minutes were then required for finer link adjustments. The initial frequency difference at either end by this means of link frequency alignment was measured as less than half a megacycle.

After carrying out surveys for Fresnel clearance last year, more extensive microwave link equipment operating on 3K, 5K and 10K Mc., together with a flying spot scanner television system, was set up last January at Mt. Macedon (3,300 ft. above sea level) by VKs 3ZAF and 3ZKC/T and at Arthur's Seat (1,050 ft. above sea level) by VKs 3ABY, 3ZMQ, 3ZLX—the path distance being 70 miles. Due mainly to a failure in the six metre liaison equipment and some unusual difficulties on Mt. Macedon, the two-day operation was unsuccessful.

A number of long-distances (50-200 miles) microwave paths have been examined and several of the shorter-distance paths comply with the "first Fresnel zone" clearance and also the "50  $\phi$ D" criterion for path obstacle clearance requirements.

The main technical problems at present are lack of heavier transport for the equipment and petrol or diesel alternators for reliable power. It is for these and other reasons that we have been forced to postpone further experiments, at least until a suitable solution is found. Certain simplifications will also be made to reduce the overall weight of the equipment.

Responsibility for maintaining reliable 2 metre liaison lay in the capable hands of VK3ZAF and Peter McKenzie (Dandenong) and VK3ZMQ (Highbett).

The Highbett end of the link was erected on sloping ground outside the VK3ZMQ QTH.

Our group also gratefully acknowledges the co-operation of the HSV7 management and the HSV7 transmitter staff on Mt. Dandenong.

Although our aims were primarily those outlined previously, this microwave QSO will be claimed as an official two-way Australian v.h.f. record for the 3,300 Mc. band.

—M. L. Oliva, VK3ZKC/T.

## ROSS HULL MEMORIAL V.H.F. CONTEST

Please note the following amendments to the scoring table of the above Contest:—

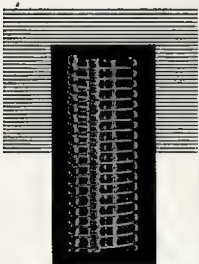
Delete 288 Mc.—Withdrawn from Amateur Service from 1/7/63.

Insert 420 Mc.—From and including 1/1/64. Scoring for 420 Mc. contacts will be identical with that shown for 576 Mc.

576 Mc. Band: It has been erroneously stated in some quarters that this band is not available after the end of December 1963. Page 6 of the current issue of the Call Book states that 576 Mc. band "is allocated on a temporary basis until required by the Broadcasting Service." As no advice of such requirement has been received from the Australian Broadcasting Control Board, this band is still fully available to the Amateur Service.

## R.D. CONTEST RESULTS (Continued from Page 11)

Queensland		
K. Chilverton	...	806 points
WIA-14018—C. H. Thorpe	...	433 "
W. Whiteway	...	368 "
L. O. Tully	...	363 "
L3233/VK4—R. Erwin	...	198 "
L4011—C. Molnar	...	190 "
L4023—R. E. Rumble	...	174 "
L4031—J. L. Kelly	...	167 "
L4032—C. Patten	...	164 "
L4010—G. V. Franka	...	90 "
VK42GD—Ineligible Log.		
South Australia		
WIA-15015—W. J. Clayton	...	736 points
L5049—D. DeCean	...	567 "
P. J. Usher	...	469 "
L5030—F. W. Ashlin	...	451 "
L5053—G. Bolt	...	388 "
D. Murdoch	...	376 "
R. Whellum	...	157 "
Western Australia		
WIA-15021—P. W. Drew	...	990 points
L5055—D. S. Pratt	...	523 "
L5010—H. J. Thompson	...	215 "
Tasmania		
G. C. Johnston	...	851 points
R. Balour	...	647 "
R. J. Nutton	...	474 "
S. Cooper	...	253 "



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## S.S.B. TIPS

## THE SWAN TRANSCEIVER

This is not meant as an advertisement for the Swan manufacturers, they really don't need it, as anyone knows who has heard their sets on the air. The block diagram (Fig. 1) gives the general outlay. It has been re-drawn from the operating manual's picture, where it is not too clearly presented.

The circuitry is very simple, they originally used a hybrid crystal filter on 5775 Kc., now have changed to approx. 5,200 Kc. in the newer tri-band versions, so that the 20 and 80 metre American phone bands are covered with one v.f.o. frequency range.

The v.f.o. is a type Colpitts circuit. Its frequency is doubled in the plate circuit for 20 and 30 metres, and tripled for 40 metre operation.

## S.S.B. RECEIVER A.V.C. AND PRODUCT DETECTOR

Many, and some very complicated, circuits have been published in the past and I wonder whether the fairly simple circuit used in the Collins KWM2 is sufficiently known. It is shown in Fig. 2.

One tube, the 6BN8, does the entire function of a.v.c. rectification and product detection. Evidently Collins is not afraid of b.f.o. voltage leaking back into the a.v.c. rectifier section and upsetting the (delayed) a.v.c. action. Note the small resistor from grid to ground in the product detector!

In addition, they control the r.f. gain of the receiver in the same grid circuits of the r.f. amplifier and two i.f. amplifiers, where the a.v.c. voltage is applied, with an adjustable negative bias.

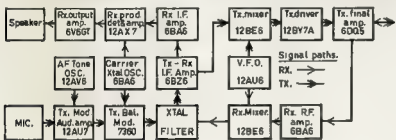


Fig.1. BLOCK DIAGRAM "SWAN" TRANCEIVER.

None of the r.f. circuits in the set are switched in going from reception to transmission, not even the antenna! The p.a. plate circuit serves as a tuned input circuit for the receiver r.f. amplifier.

The change-over relay applies a 90 volt negative blocking bias on the tubes in the set's stages not being used, and also opens the plate voltage supply to the same stages.

The oscillators are permanently connected to both the receiver and transmitter mixers and the input to the crystal filter; likewise to both the balanced modulators and to the receiver mixer, as well as the output of the first i.f. amplifier to the next two stages. This seems to do no harm at all and certainly simplifies the transceiver.

Where the S meter of the receiver works on the screen current of the first i.f. amplifier, this control affects the meter reading just as in most receivers, but the received signal still continues to register on the S meter in the normal manner and to the original strength indication! So one can actually read the strength of the peak signal level by backing off the r.f. gain till the S meter just barely kicks on the peaks of the received signal.

### AMPLIFIED AUTOMATIC LEVEL CONTROL (A.A.L.C.)

There are as many ways to apply a.l.c. to a s.s.b. transmitter as there are perhaps methods of applying a.v.c. in a receiver—delayed, hang-on, amplified and what have you. It all boils

down to feeding a bit of the output voltage rectified back to one or more control stages earlier in the set.

Hallicrafters, in their new s.s.b. transceiver SR150, apply what they call something new, **amplified** automatic level control, not **lead** control, as erroneously mentioned several times in the s.s.b. column in June '63 "A.R." On first sight there seems nothing new, just as in a receiver where one can amplify the signal in a separate stage before rectifying for a.v.c. voltage. But there is a difference.

Hallcrafters no doubt figured that if their twin output tubes are operating in ABI up to the point of grid current flow, there should be plenty of output and to obtain even more would require extensive measures of final drive regulation, etc. So why not limit the drive to the final amplifier to just that point of grid current flow?

To do this, they include a fairly large resistance in the return of the final amplifier grid circuit to the negative bias source and only provide by-pass for r.f. As soon as grid current flows, a small audio voltage will appear on this resistor. This audio voltage is fed to the grid of a triode, amplified and rectified with a pair of diodes. The resultant rectified voltage controls the grid of the r.f. stage after the crystal filter.

In that manner, with proper control of the a.s.l.c. time-constants, only a fraction of a phrase will draw grid current and immediately the gain of the set is reduced. The result is a perfectly clean signal with hardly a trace of distortion products. Worth duplicating!

—Arie Bles, VK2AVA.

### NEXT FEW ISSUES OF "A.R."

Readers should note that the January 1964 issue of "A.R." will be printed early in December, 1963 and should be received in your mail box about late December. The February 1964 issue of "A.R." will be printed also in December, due to the fact that our Printer will be closed during January. As a result of this, it was not possible to print any DX, V.h.f., Sideband, S.W.I., Y.R.C., Federal or Divisional notes, nor any Hamads. This edition will be a technical issue without any other features. It will be mailed early in February 1964, hence you may not receive it in your post box until mid February. So please do not write in complaining that this particular issue is late.

Publication will return to normal with the March 1964 issue, for which all copy should be received at P.O. Box 36, East Melbourne, C.2, by the 8th February, 1964.

## "IT HAS BEEN SAID"

The D.X.C.C. "rst race" seems to cause participants to forget some of the Amateur Code. The latest development was overheard on the 15th when two amateurs were being made for a sked to be made with a DX station where activity is limited, for an American station, the operator of which was absent from the U.S. Another Amateur was to operate the station of the absentee for the sked. Fortunately A.R.H.I. have caught up with some of the questionable practices from time to time and disallowed claims for credit.

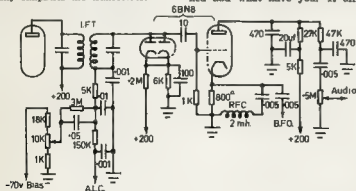


Fig. 2. COLLINS AVC-PRODUCT DETECTOR.

## TWO-BAND RECEIVER

(Continued from Page 7)

date stations stretching from 144.01 to 146.26 Mc. Fortunately, the dial "expands" as we tune up the band.

## POWER SUPPLY

As remarked earlier, the power supply contains two separate supplies, one for the transmitter and modulator, and one for the receiver. The front panel contains a switch for 240 volts a.c. to each supply, a pilot lamp, and a meter calibrated 0-200 mA. This meter reads the total current drain of the receiver supply, which is 100 mA. on b.f., and 130 mA. on v.h.f.

The receiver supply consists of a transformer providing 250 volts a side at 150 mA., with a 5Y3 and a capacity input filter. Under load, it provides 275 volts d.c. A resistor drops this for the VR150, which provides 150 volts regulated for the h.f. oscillator. The centre-tap of the h.t. secondary and the shield are earthed by a relay, which open circuits the earth connection on transmit. The transformer and capacitor are new, but the valves, chokes, sockets and resistors are ex disposals.

The transmitter supply is made up of disposals gear. The transformer came from a p.a. amplifier ("Now hear this") and provides a h.t. winding tapped at 380 volts a side, and 230 volts a side. The filament transformer has two 6.3 volt and two 5 volt windings. Thus we were able to provide two h.t. outputs, each using a 5U4. One provides about 350 volts d.c. through a 100 mA. choke input filter, the other about 250 volts d.c. through a capacity input filter. The larger voltage will be used for the p.a. of the transmitter (probably a 6QE03/12) and the modulator (perhaps a 6N7); the lower voltage for the exciter and pre-amp. stages. Current from the major transmitter supply will be read in the p.a. meter and/or modulation meter, so there is no need for a meter for this on the power supply panel.

The receiver chassis is placed in the bottom compartment of the tabletop

cabinet, which places the tuning knob convenient to the hand. The power supply sits in the centre compartment, and the top compartment will hold the transmitter and modulator. The cabinet is made of 8" x 1" maple, and measures 19" high by 15" wide. It will be given a coat of undercoat and painted grey enamel. All cable connections are made at the rear. A six-pin socket is used for the transmitter power supply, merely to distinguish it from the receiver supply.

## OBITUARY

### MALCOLM PERRY, EX-KCP

Malcolm Perry's death on 8th October took from the thinning ranks of Wireless Pioneers one who had been active in the Wireless Institute since its foundation in March 1919. He followed Wal. Hannam (active still as VK3AXI) as Secretary of the Institute when Wal. departed with the Mawson Expedition for service in the Antarctic in 1911.

The Official Call List of the Wireless Institute of N.S.W.—as it was then called—indicates that Malcolm operated a spark transmitter under the call of KCP. All pre-World War I. Amateur Call Signs commenced with the letter "K".

Resumption of Amateur activities in 1910 saw Malcolm very active in handling Wireless Institute affairs. Interesting reports of lectures given at the Institute meetings appeared in detail in the magazine "Sea, Land and Air," which was well known and remembered by all genuine old timers of those days.

Malcolm attended both openings of the Dural Station and the Wireless Centre at Atchison Street. This memorable occasion has been recorded in colour film as he chatted with Chas. MacLurean (VK3CND) and Jack Pike (VK3FP), who may, even now, be swapping reminiscences of the foundation days of Amateur Radio with Malcolm in the Spiritual Lands of the Great Beyond.

### JACK FERGUSON, VK3FP

One of the real old timers, Jack Ferguson, VK3FP, was prominent in the affairs of the Old Waverley Radio Club in days gone by. Since the war, in his retirement at Saratoga, he was very active on 10 and 15 metres. A great worker and supporter of the Central Coast Section of the Institute, N.S.W. Division, Jack will be sadly missed by all of us.

## TO YOU, THE READER

On behalf of the Publications Committee of "A.R." it is my very pleasant duty to wish you, the reader, and your family, the Compliments of the Season.

It has been with your assistance that your magazine has been published for yet another year, as it is the readers who maintain the continuity of publication, because it is your activities, both technical and personal, which makes the contents of "A.R." So it is very sincerely that we wish you a Merry Christmas.

—Ye Ed.

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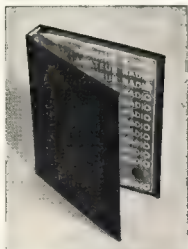
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ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB EDITOR

## V.H.F.

The DX season is about to commence and attention will be focused on what will be the last year of 50 Mc. Channel 9 in Melbourne is scheduled to begin its transmission on 1st April, 1969, and a new era in t.v. and i.t.v. will begin. This DX season will occur during the summer months and many will be interested in its outcome.

It is expected that the peak of the season will occur during the Ross Hull Contest when the numbers using the bands will be at a maximum. Because of this, your operating technique should be at maximum and all the courtesies of an Amateur operator should be extended to your fellow Amateurs. The use of excessive modulation should be avoided and the v.f.o. should be used with discretion. These courtesies make for easier operation all round.

Don't forget that there are many stations operating above the first 500 kc. and tune that section. You will be surprised how many stations operate high in the bands.

So far it appears 8KK will be operating from Alice Springs. (Refer VK3 notes.) 32B/V is last heard of in the Simpson Desert, will probably be back in VK3 early in Dec. No news known of any other special activity this season.

Of interest was the VK4-JA opening on Sept. 15 when JA1-1-1 were working in VK3 between 1500-1800 E. & 4-7. Many VK4s were heard. On Sept. 28 32E/V in Gippsland heard on JA but could not raise him—who said the band was dead.

Of special note to all correspondents. Please forward your notes to reach me no later than 1st of each month. Due to the editorial retention of all the notes must be in earlier and I must meet an earlier deadline, any notes reaching me later than the 1st cannot be considered, so keep the good work up and remember the earlier date. For future reference, there will be no v.h.f. notes appearing in the Feb. '69 issue, but please forward me your notes as usual.

I would like to take this opportunity of wishing you all the very best wishes for Christmas and for the coming year. I trust that you all enjoy your DX during the Christmas season. What band. Don't forget 420-430 Mc next year and look forward to hearing of your successes.

Those using 420-430 Mc. after 1st Jan. for Ross Hull Contest should use the points for 576 Mc. section and include them in your score. All stations participating in the R.H. should send in a log no matter how small the score. 73, see you on 80 Mc. during the Contest, 32GP.

P.S. Welcome to Reg. 32MR, new writer for VK3 this month.

### NEW SOUTH WALES

John JANP's October meeting lecture seems to have an effect around the band, with a lot more stations using phase modulation, also some have been building discriminators. I'll check on these using p.m. or f.m. are JANP, 3DR, 32AR, 32RG, 32KP, 32CF (50 mhz), 32AM, 32C (this one, but would use it), how about 1st John? 32NS (it will go), 32AQ (50 mhz), 32AV, 32BL (146 Mc.), 32GB.

All VK3 users are reminded from time to time that the first 150 kc. of 144 Mc. band, by gentlemen's agreement, is to be used by country stations trying to work into Sydney. It seems this agreement is not being kept by a few signals I have been hearing lately.

John 32AV's lecture on 433 Mc. at Nov. meeting was well attended and absorbed by all. The Blue Mountains and Newcastle were also represented. Don't forget the next auction at Wireless Institute Centre on Friday, Dec. 6.

The Jamboree-on-the-Air seemed a fairly successful event on v.h.f. I counted 15 stations on 2 mhz in Sydney; at Newcastle area, 32KW and 32AP were active. Charles Hunt 1296 was also active and is now 32LE. 32MR is smoking cigars and throwing parties in celebration of working Wollongong 32KW who is working on 80 mhz for the coming year.

Bob JOA is on the sick list, and has had to give up activities in the Institute for a while. Sorry to hear this Bob, but hope to see you soon. He's on the Oct. 10th, with 32H as the fox, resulted in Lance 32KP with Mac 32AR taking first place, David 32VW and Mac 32H second, and Paul 32PB third, 73, 32MR.

### VICTORIA

The first item of news this month is that the V.h.f. Group will be holding the second V.h.f. Get-together for this year. It will be held at Warrigall Park, at the end of Bell Street. There will be talk-in stations on six and two metres, both a.m. and net freq. will be used. Council has donated a sum of money to buy some v.h.f. transmitting tubes which will be awarded as prizes, so on Dec. 1 bring your 1L, XYL, and a picnic lunch to Warrigall Park at 11 a.m. and enjoy yourself.

The Field Day held on 20th Oct. was very successful with 18 portable stations out. The 3 mhz band gave some good QSOs to VK3 on the day, with 3CS, 3XIL, 32EV and others being worked. At the moment the place getters are 1, 32ER/P; 2, 32OB/P; 3, 32AV/P; 4, 32JY/P.

DX of late in VK3 has mainly been in the VK3 area, although some VK4s have been worked on 3 mhz. On 8 mhz 32AK was worked recently while a few weak signals have been heard to the north as everybody waits for the DX to break and the contest to start.

Neil 32RT at Caulfield is a newcomer on 3 mhz and is putting out a fine signal for his 15w. and a dipole. David 32GP is now on two with 15w. and a 9 ft. beam. Norm 32M is also new on two. Jim 32CE (Frankton), who fights the DX back with a stick, is now on six with 15w. to a 6CK8 and 2 ft. beam. Peter 32PC hopes big things with his new rig and 10 ft. beam. John 32LQ is back on 8 and 2 with a 30 ft. mast and celebrated by winning the 8 and 2 mhz scrambles. Andy 32AC (St. Kilda) has tamed his lumpy carrier and will soon be on a.m. Bert 32KU and XYL Peg at Kilmore have been putting fine signals into Melbourne on 2. Peter 32PD is active on 3 mhz, we think a fugitive from 80 mhz QRN Max 32CW has now a solid signal on both 8 and 2 mhz. Rod 32WV has been threatening locals with the idea of 100w. and 4 ten-1's. Stan 32PL (Moe) has been active around Melbourne as a 3 mhz mobile. Graham 32AQ has been very active of late only he has not been doing the talking. Maxine, his XYL, has been or was taken into his rig, 73, 32NJ.

### SOUTH AUSTRALIA

50 Mc. Biggest news here is that Douglas 32KX formerly 32CS, Alice Springs is on 50 Mc. He is working at 8AL and we hope to hear him in the coming season. Frequencies and equipment details are so far unknown, but it appears that Doug is not using the big.

big Adelaide rig (4/250A). Probably his mobile is in use (822A).

After the sensational JA opening in Sept. this month has been quiet. New chums on include 3JX, 50.225 and 32DH. New mobiles are Brian 32CO, Ian 3IK and Jack 32T. During the Labor Day week-end (12th Oct.) the Mt. Gambier V.h.f. Society went portable on Mt. Edward and worked Adelaide stations (100 miles) as follows: 32DR, 32MK and 32DY as well as hordes of VK3 on 4 and 2 mhz.

32NK is a new man at Virginia (40 miles north) who has been working into Adelaide.

144 Mc. The onset of warmer weather has provided us with a few tropic openings on this band. On Oct. 19 32DR worked 3AGV (Colac) and 32EV (Hendland, 180 miles), also 32AV mobile on Mt. William in the Grampians. Port Pirie, Crystal Book and Whyalla (all about 130 miles) have been worked from Adelaide quite a lot recently.

Bob 3RG (formerly 3RO) has been on 3 mhz lately using a 3CR52. Cor 32KC has his full licence—3CW. We assure you that the beacon will be on either 144.3 or 144.4 and once it changes to the higher frequency it will probably stay there. In the meantime, play it safe and hush. The frequency of 3 mhz beacon will remain unchanged on 50.50 Mc, 73, 32CR.

### TASMANIA

50 Mc.: Nothing out of the ordinary cooking on this band at the moment, but one or two are thinking of building gear in readiness for the coming DX season.

144 Mc.: There have been a few openings to VK3 from the north during the past month as VK3 and VK4 have been heard in Burnie. Activity is ever on the increase with 17 stations now active in the south and about 10 or 15 along the north coast, with new stations coming on nearly every week.

At our last meeting (October) we had a visit from Ted Tanner, V3EHL, who hails from London, Ontario, and is teaching temporarily in Hobart at the moment. 73, 32AV.

### FAFSA

Only signals heard during the month were the trans equatorial scatter stations on 49.8 Mc. These signals reached 50 on four nights and were audible on a total of eleven nights. 32BV is active most evenings between 2 p.m. and 4 p.m. 32CK has not been heard lately, and a new 2 mhz call should be on the air in the near future. 73, 32BV.

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## YOUTH RADIO CLUBS

We have now crossed the Tasman Sea! In May, Rex Black answered a query from New Zealand and sent full details of the Youth Radio Scheme. Following is part of a reply received recently: "In reply to your letter of 18th May, we wish to advise that the matters raised in this letter were discussed at our Annual Conference in June of this year. It was decided by the Conference to set up a committee to look into fully the possibilities of setting up a similar Youth Radio Scheme throughout this country, under the supervision of New Zealand Association of Radio Transmitters. As this may take some time, we are therefore quite happy to allow Mr. John Gilbert of Auckland to enroll his Radio Club as a member in your Scheme." Heartly congratulations to the wise men of ZL!

Ken Matchett's fine VK3 Newsletter No. 5 arrived here with good news of progress there. Val Barnes, equipment officer, has supplies of germanium diodes and some radio equipment, as well as a supply of "A.R.N." "H.T.V.H." and other publications. These are available on other publications. Since Amateur is friendly, the donated equipment should continue to arrive—provided there are constant reminders. Other items in the Newsletter tell of doings in the clubs. Wintonagh Tech School Radio Club had a roll-call of 13 at the last meeting. V.H.I. demonstration was arranged at Christian Brothers' College, Dundoura, by Dave 22MX, Bert 22FC and Ray 22OE. Twelve members of the School Club operated with Ray (mole) and Allan 22G.

I was surprised to find the readiness with which a few Amateurs pounced on my small lapses by our two new call signs—George IG1 and Roger IRD. Our thanks, however, to the great majority who helped them with tests or merely answered their CG with a friendly contact. Club leaders should be very firm on the subject of safety as a top requirement. Impatience to get on the air could produce a scattering of safety tendencies. Young operators should be carefully protected from this. Next in importance is the quality of signal, which should be very good, preferably tested by you before it comes the new call sign. Finally, operating procedure should be well drilled beforehand and tactfully monitored afterwards for a short time. 73, Ken IKM.

Chas. LA01B enquires about the VK Award. Pleased to hear from you Chas, who has a fine list of awards that he has won over the years. They include: R.S.O.B. 21-28 Mc. Contest 1959, The Elizabethan Award, 1961; VK-ZL Contest 1957; National Association of Armchair Adventurers; Edmond Amateur Radio Society W5, 1961, National Field Day, 1960-61; R. Contest 1957, Oregon Coastwise Contest W7, 1959; Ross Hull Contest 1959-60; All Japan District; Heard All Continents; Diploma Rubiyto, 1967; Heard Zone 4, 1963, and several more.

### WESTERN AUSTRALIA

Peter LA021 put up a good score in the recent VK-ZL Contest. On the broadcast band Peter has been hearing some rather choice DX, such as Germany, Belgium, Monaco, India, Philippines, Egypt, South Africa, Yugoslavia, Italian, New Zealand, Austria, Singapore, The Monaco station runs 400kw. Thanks very much Peter on the offer of that magazine and will be happy to see it.

Was pleased to receive a letter from Ken, another keen S.W.I. in VK3. He finds the forwarding of S.W.I. reports by direct mail a bit on the expensive side and was interested to know if other members QSLed direct or through the Bureau? Direct is certainly the best way to send them, but you do have to pay a bit expensive to send many that way. A number of S.W.I.s do send their cards through the Bureau.

Now come on you other VK3 boys, let's hear from you, and so join us on our monthly page. May 1964 bring you much happiness and Good Luck. Merry Christmas to you all. 73, Mac Hilliard.

### EE LEADER

	Country	Zns.	S.W.I.	Rd.	W.
	Conf.	Rd.	Conf.	Rd.	W.
E. Treblecock	281	289	40	—	80
D. Grantley	115	293	28	30	111
A. Westcott	91	292	28	30	111
M. Hillard	93	294	33	32	104
M. Cox	90	281	30	47	103
P. Drew	75	212	26	21	138
C. Abernethy	91	292	28	30	111
N. Harrison	48	139	30	5	37
L. Thomas	41	138	26	16	37
G. Earl	34	126	16	5	108

—Mac Hilliard, WIA-L3074.

## Correspondence

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

### Editor "A.R.N." Dear Sir,

During the past months much has been said and done for the Youth Radio Scheme. Has anyone ever considered giving assistance to S.W.I.s?

There would be no need to promote an interest in radio for that is already there. An interest that could be furthered no end if assisted.

I must admit that on occasions by invitation we have had talks by full members, which have been well received. It is to be regretted that seeking information should not be in an institution such as ours. I feel sure that we could retain those associate members that gradually disappear from the ranks if some medium of tuition was organized by the full members of the W.I.A.

Surely there must be chaps who are willing to spare one evening to impart a little knowledge to our members, for after all, there are only twelve meetings in a year.

S.W.I.s join the W.I.A. with the thought in mind that some form of teaching is to be had only to find themselves dependent on other S.W.I.s. The foundation is there, so with co-operation from members willing to give a little of their time, the chance in educating associate members would be more than appreciated.

—Chas. Abernethy, WIA-L3211.

### CALL BOOK MAGAZINE

The Federal Treasurer, W.I.A., has for sale at £1 per vol. sold some 1000 copies of this great directory of Amateurs. There are two editions: United States and "Foreign." The former, except United States, Apply Bob Beane, VK3NU, 95 Hardinge St., Carlton, Victoria.

Awards Here are full details of the Heard All V.A. Award, the card from the following are required to enable you to become eligible for this award: VK1, VK3, VK4, VK5, VK6, VK7, VK8, plus one card from Christmas Island or Cooks Keeling VK9, one from Neurus or Norfolk Island VK9, one each from Territory of New Guinea, Papua VK9, one from Macaronesia or Heard Island VK9, plus one from the Australian Antarctic mainland.

Eric Treblecock is our awards manager and all applicants should send their QSLs to him, but don't forget to include return postage. Our other award is the D.X.C.C. and we are going to have a special certificate for this. When you reach 200 countries confirmed let us know and you may be presented with DXCC award. This one is only a suggestion at the moment, but we think that you will agree that it is not a bad idea. The awards will be available early in the new year for certain.

Congratulations to the award winners in this year's National Field Day Contest in the receiving section. It is pleasing to see so many entries for this contest. After a slow start this contest is rapidly becoming more and more popular each year. Contrasts to you, Eric, for upholding the VK3 S.W.I. Group in the Contest. Owing to other commitments I will be unable to carry on with these notes in the new year and I would like to thank all contributors.

### VICTORIA

Our Annual Xmas Wind-up will take place on Friday, 13th Dec. So come along and wind up the year in the proper way. Soft refreshments will be available during the evening. Maurice has been up to his neck with work, however, he has managed to find time for the bands. Greg L3138 has been busy fishing in between the DX. He has been rewarded already with his new 50 Mc. converter, as the Chas heard the VK3 New Zealand Contest, very busy studying for his ticket. Yours truly has found conditions fair at times. He has heard several weak but distinct signals on 28 Mc. one night. TTRAN has been heard on 14 Mc. a.s.b. Greg recently heard what he thought to be a VK7 and a ZL on 50 Mc. However, he was told that they were on 14 Mc1 (His converter i.f. is 7 Mc. so can anyone help him with the answer on this one.)

### NEW SOUTH WALES

The monthly meetings are gradually getting more support from members, who are benefiting greatly by the talks and the discussions that take place during the evenings and over supper which always terminates our happy and informative get-together.

Radio New Zealand welcomes reports from overseas listeners. All reports are acknowledged by QSL card. All reports should include the wavelength, date, time, and if any, details of the interference. Radio New Zealand programme to Australia from 1900 to 3145 E.A.S.T. ZL7 on 49 metre band, ZL3 on 31 metres. Address Radio New Zealand, Box 2386, Wellington, C.I., New Zealand.

Radio Amateurs' Notebook from the Voice of America can be heard at 1845 E.A.S.T. Sundays on the 30 and 40 metre bands. Radio Canada 9 w. Stations, 1739 E.A.S.T., Sundays, 40 metre band.

Ros L2323/VK4 is using a National TEST with a 3 ft. aerial. The E.D. Contest has managed 198 points. Sid L2328 has an AMR300 but is having trouble with the coils at present. The 1963 test reports have been sent in the phone area of the recent VK-ZL Contest and in that short space of time managed a good score, plus four new countries. Don's latest card to hand is from LY402R. Congratulations to receiving your award for the 1963 ZL Memorial Contest.

Now is the time to make sure your v.h.f. gear is working, as the Ross Hull Contest will soon be under way. Thought for the month: Work safely, don't become a ghost of your former self. 73, Chas. Abernethy.

### QUEENSLAND

It is very pleasing to see our Sunshine State on the Air. The Action 3000 S.W.I./VK4 has been away on his Gulf trip, and of course has not been able to listen on the bands and become the fact that he is unable to get off his confinement. Pleased to have heard from you again Alf.

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# FEDERAL AND DIVISIONAL MONTHLY NEWS REPORTS

(SEND CORRESPONDENCE DIRECT TO DIVISIONAL REPORTER NAMED AT PARA. END)

## NEW SOUTH WALES

### HUNTER BRANCH

The November meeting was held at the Technical College, Newcastle being Amateur Television, by Les 2ZDN, Neil 2ZCU and Remy 2CN who gave a most comprehensive three part lecture on history, theory and practice of tv transmission. Neil described a method of using the local tv. signal to scan a slide, with the programme off, of course. Des displayed various units concerned with generation of 455 Mc. signals and displayed a closed circuit set-up with flying spot scanner and 14 inch tv rx. Rodney described and displayed some very expensive camera tubes. Des hopes to be able to take pictures mobile with a transistorised camera unit—only 27 transistors.

Forty-one members and visitors were there to listen and watch. At the last examination four local chaps sat for the big quiz, three for the full ticket and one for the limited. Bruce collected another big batch of QSLs for Jim 8AHT at the meeting: Jim must have a mighty score by now. It was a delight to see a letter to our 2L from the form of Bill 2ZL. Tony 2ZC has been a very proud father the last couple of weeks. During the short time he was able to get away without asking permission, Tony built a new turnstile for the car to give omnidirectional signals on 2. As well he reckons a few more pieces added will make a play pen if the idea is not unanimously agreed upon at home.

Les 2FJ also has a reason now for not being on the air as much as he'd like since he's been given some extra chores to do following the arrival of the infant. During November there is to be a hobbies exhibition at Scouts and the branch has clubbed together to display some Amateur gear at this function. It is hoped that this may fire up some enthusiasm in the top of the valley and introduce the Amateur to the public as is our aim.

Key 2KWK, Vic 2AKP, Des 2ZDN and Frank 2AFO did a good job during the Scout Jamboree-on-the-Air to further enhance the name of the Radio Amateur and our congratulations go to them and any others who may have been missed for a job well done. By the time you read this, Lionel 3CS will be back in his favourite country and don't forget that he will be the lecturer at our December meeting, to show slides and talk about the trip. Try to make it if you can. The usual place, room 18, classroom block, at the Tech. College is the venue and the date is Friday, Dec. As Bill 2ZL will be supplying the supper, I'm sure you'll want to come. Hope we see you at the time it is no meeting until February. Seasons Greetings and 73, 2AKX.

## VICTORIA

### MIDLAND ZONE

The month of October showed an increase in activity in the Midland Zone, particularly on the 80 mhz band despite the varying conditions and static level. The Monday night hook-ups on this band have improved, both in numbers and in general activity. The members, together with a few more zone members coming in to keep the ball rolling. Stations active are: 2ZK 3FO, 2ZND, 2AKA, 2AQL, 2AMD, with 2ZIK still active on 2 and 1 mhz with other members of the zone active on this band. I was on the air for the Scout Jamboree and had a Castlemaine group here on the Sunday morning at which time several good contacts were made. Morris 3KO also was very active on the Jamboree and as a result is now a regular stender on the hook-ups on Monday nights.

### SILENT KEY

It is with deep regret that we record the passing of:—

VK7FJ—Jack Ferguson.  
EX-XCP—Malcolm Perry.

As we have difficulty in getting sufficient members to attend zone meetings, it has been decided to conduct as much of our zone business on the air each Monday evening on 80 metres, so all members please note. We usually get under way about 8.30 p.m. 80 mhz activity is sporadic and although I have had some good DX contacts on this band, the interesting feature is the re-appearance of short skip which allows Interstate contacts quite frequently. The increase in a.s.b. activity is also very noticeable. 73, 3ND.

### WESTERN ZONE

Guess we all enjoyed the Convention held last month in Ararat. Have some very keen members travelling almost 300 miles each way. Next year Convention will be held early in October, near the border so as these chapies will have an easier day.

Was pleased to see George 3GN, who has not been active for a while. Alan 3HL was unable to come to the Convention because of a wog, but is fit again now, working a.s.b. and a.m. mostly on the DX bands. Your scribe for this month will have S.E.C. power before these notes go to print. 73, 3AKW.

### SOUTH WESTERN ZONE

There has been more activity in the past few weeks with 3AGD and 3AKR attending the Thursday night hook-ups. We are hopeful of hearing more of the zone members on especially the Ballarat and Hamilton boys. SWK is a regular along with 3KE, 3AGI and self. 3AKH seems to like sending out transformers. 3CJ was in Warrnambool recently, but did not drop in to say hello, you will be in trouble if you do that again Col. With re-

## W.I.A. LOG BOOKS

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ference to the Jamboree-on-the-Air, John 3AGD is to be commended on his job of organising in this zone. Harry 3AGI and Bill Wines operated portable with the Second Warrnambool Scouts at their camp in the Brucknell bush but were very shielded. Had contact with Allan 3ATD at Mooropna but a strong signal washed us out, however Jack 3JA turned his home tx on and we took the boys to his QTH and made some good contacts. Don Gardner and Bill Wines have now started the Y.M.C.A. Radio Club with 20 students, the official club call sign should be 3AAW. We will meet each Wednesday night at 7.30 p.m. and will be on hook-ups each Thursday night and Sunday morning W.I.A. call-back, 73, Bill Wines.

## QUEENSLAND

### TOWNSVILLE AND DISTRICT

We all were expecting to have a wonderful time on the Scout Jamboree week-end, but the noise set in and it was frustrating to have so many Scouts and Cubs in attendance when so little was heard and worked. My score was 16 QSOs for 30 hours at the rig. To all those who participated we offer our thanks.

## TECHNICAL ARTICLES

Readers are requested to submit articles for publication in "A.R." in particular constructional articles, photographs of stations and gear, together with articles suitable for beginners, are required.

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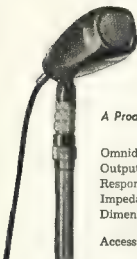
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The weather has now altered since the Europeans can be heard weakly around 4.30 p.m. E.A.S.T. Bert patiently waits the arrival of George 4NE from the north west. Charlie 4RQ, Ted 4ZJ and John 4ZJ are seldom heard on the band. I wish each and every one the Seasonal Greetings, also in the New Year may your signals never fade. 73, 4RW.

#### WIDE BAY AND BURNETT BRANCH

Those who tune in to the Kookaburra session on 30 mX at 900 must be well informed on the matter pertaining to radio as the boys discuss antennae, capacitors, radar, push-pull, silicon rectifiers, etc. Newt 4QW came up the other morning with push-pull, I thought that he was calling the ad. George 4ZJ who has been enjoying a few months holiday at home in Maryborough, is returning to New Guinea. Bert ex-GW4, Maryborough, now has his VK call which is 4WK, and 160 mX is his stamping ground. Gordon 4GR at Maryborough said his bit by setting up a rig at the Scouts hut and made 11 contacts of about half an hour each, so that would give the Scouts a fair insight into Amateur Radio. Harry 4ZHG married Eric 4ZG, who is a member of the Scouts at their places. They contacted among others Jim KH5ELQ at Pearl Harbour, Hawaii. Jim was tickled at Harry's "Australasia" accent. Harry, by the way, came from the land of many years ago. Eric also came in on this QSO and when they signed off there was a mutual "4" and "Z" on the air. The Scouts try to have a QSO with him. Another contact was DU1BS/P in the Philippines, whose XYL was called at Harry's 4ZG. The Scouts had been operating for 40 years continuously with relieving operators. They were just acknowledging the call and giving the report we have so many lined up waiting their turn for a contact. So all things considered, the Jamboree appears to have been a success. 73, Fred Cox.

#### WINDY AUSTRALIA

I hear our fame is spreading and we have some very interested boys on Christmas Is. (Indian Ocean side). A recent successful candidate for the Ham exam was Allan Morgan, WA, and we send especial congrats to Allan and all who are working on the exam. It is a move afoot in the formation of the local Christmas Island Radio Club. Interest is running high and the boys are doing well. We have donated books, etc., to help them along. The recent 40 mX scramble in Sept. brought the club to the top in winning the President's Trophy, with 4KN taking off the Life Members' Trophy.

A host of reports about the Jamboree-on-the-Air, held at Christmas Island, were heard by Scouts at the 1st Tuart Hill Post. Pat 6FH had 39 Scouts at various times over the period from Kenwick, Watlie Grove, and Riverton. However, the winning ticket must go to Jim 6RU who not only had Scouts and Commissioners present, but Girl Guides as well, and Jim says he is looking forward to the time when they have a Girl Guide Jamboree on the Air. This is closely followed by Tony 6H, who has Scouts camping on his property at Waroona for the week-end.

Pat 6FH is going to shift to Narraginn. Does anyone listen to Slow Morse? We don't know, neither does Alec 6AS, who has been potentially sending Morse for 12 months now. If anybody is listening, send in a report, please.

In about six months time we hope some good news about the Scouts will be heard. We are in the process of setting up a new Council for various offices. Start thinking about it now, adjust your programme for 1964 to include your year's service for the District.

On behalf of all Council members and this Division may I wish you and yours all the best for Christmas and a happy new year contacts in the year of 1964. 73, 6LS.

#### TASMANIA

On 5/12/63 the ZLs are holding a mammoth field day on 80 and 144 Mc. Stations from all over both islands will be taking part. The

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VK7 V.M.F. Group is organising a station to operate from 30 Wellington on 144 Mc. The call used for the occasion will be VK7WI and operations will commence about 1200 hours our time.

The Scout Jamboree-on-the-Air was by far the most successful held to date. The main reason for this was that the Scouts were better prepared, more sensible questions being asked, and more intelligent answers given. Stations known to have been participating in the south were 7RX, 7ZZ, 7CT/P at Hounville, 7JB who operated with 7BS, the 12th Robert Scout Station, portable at Orillon Park, 7EB, 7MP, 7S1 and 7J7 portable at Soreil.

We were recently visited by SLT and 22T.M. By the time this goes to print, 7CT will be equipped for reception on 50 Mc., so that he can re-broadcast the v.h.f. notes on the TWI broadcast. 73, 7ZAV.

#### NORTH-WEST ZONE

The festive season is almost upon us once more, and no doubt will bring a lot of mobile and portable operation on the bands. In fact our 70X has jumped the gun and is away where down south on holiday, complete with mobile and fishing rod. Hamfest for '63 is now over, and general opinion is that it was not up to the high standard of last year's function, due mainly to the lack of organised activities, especially those for h.f. operators. Quite a number of North-West Zone members attended. Rather sad to relate that George 7XL lost his mobile whip antenna on the way back from work, but got one out for the day. Merry Xmas to all. 73, 7ZBH.

#### HAMADS

Minimum 5/-, for thirty words.  
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Advertisements under this heading will only be accepted from Institute Members who desire to dispose of equipment which is their own personal property. Copy must be received at least 30 days before the sale. Box 36, East Melbourne, C.E. Vic., by 4th of the month, and remittance should accompany the advertisement. Call signs are now permitted in Standard advertisements not accepted in this column.

**FOR SALE:** Collins Equipment of the late VK3JK, 32S-1 Transmitter, 2370; 75S-1 Receiver, 4370 or offer; Astatic S.B. Dynamic Microphone, Model 10-D; Dow Key Relay, DKGO-D2C, 6 volt a.c., s.p.d.t. r.f. switch with d.p.c.t. auxiliary contacts and special isolation connector in de-energised position. All offers in writing to W. L. Jackson, VK3XXM, 23 Maline St., Ormond, S.E. Vic.

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**FOR SALE:** Tc Geloso into QQE06/40, mod. pair 2E26, complete power supply, very small and compact, £25. AR88, absolutely mint condition, £100. Class C Wavemeter and vib. supply, 27/10/0. Broadcast chassis, going OK, each £2/10/0. Car Radio, 8 miniature tubes, permissibility tuned, works OK, 12 v. £7/10/0. Type 3 M.C.L. and spares, 6146 p.c. transistor modulator, perfect, £20. Dual Vib. Supply for AR88, £20. 17/10/0. BC457A Command Tx, £4. BC458A, converted 80 mX v.i.o., £4. BC454B, 3-6 Mc. Rx, complete, 12v. generator and loop aerial for Tx Hunts, 27/10/0. B. & W. Coll Turret, new, 80-10 Mc. 3. 12v. Generator, complete, cables for 322, perfect, £3. Rx,

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**GELOSO G209 Receiver**, first class order, £100 or best offer. Also 2 Metre Converter, with crystal, £8. VK2AEB, Box 446, P.O., Griffith, N.S.W.

**GELOSO G209R and speaker** (in metal cabinet, £100 or near offer. VK3ANY, Bus. Phone 26-3381.

**MOSLEY TA-33 (500w.)** Three element Tribander (10-15-20 mX) Beam in original carton, never assembled, £35. John Miles, VK1JM, Mathematics, I.A.S., A.N.U., Box 4, G.P.O., Canberra. Phone 4-0422, Ext. 2982.

**SELL:** AR7, clean, unmodified, seven coil units, with good power pack. Ideal for a.s.b. mod. Best offer. VK-3AXK, 15 Oakhill Rd., Mt. Waverley, Vic. 28-4968.

**SELL:** Auto-Transformer, 250v.-123, 115, 105, 95; Secondary 155, 150, 145, 140, 5 amp. £4. A.W.A. b.c. Receiver, Model 617TY, six valves, 540 Kc.-22.3 Mc., in seven bands, £12. Ferris Model 99, 6v. car b.c. Rx, £10. G. Maess, 28-6159 (Vic.).

**SELL:** Heath DX40-Geloso, all bands, both units power supplies enclosed. A.m./c.w., conversion data for a.s.b. available. Very good condition, £70. VK4CK, 72 Canning St., Warwick, Qld.

**SELL:** KWM1 Collins S.B. Transceiver, c/w 240v. a.c. power supply, covers 14-30 Mc., easily extended to 7 Mc. (see Aug. 1962). Nearest offer to £360 gets an immaculate unit. 23 Surrey Road, Kerwick, S.A.

**SALE:** Panda Explorer Transmitter, all bands, crystal mike, 150 watts. Write VK6WS.

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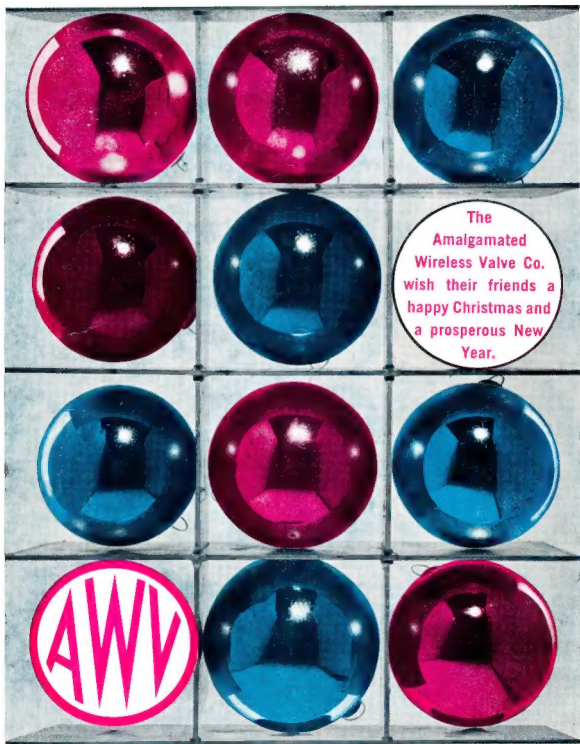
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